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TITLE: ELECTRIC VACUUM CLEANER

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ABSTRACT:

PROBLEM TO BE SOLVED: To provide an electric vacuum cleaner capable of preventing dust collecting performance from being reduced due to a reduction in a suction force.

SOLUTION: The electric vacuum cleaner is provided with a cleaner main body 10 provided inside with a centrifugal dust collecting part 14 and a motor-driven blower 11, an intake body 16 provided with an intake 15 for sucking dust on a surface to be cleaned, a suction pipe 23 to connect the centrifugal dust collecting part 14 to the intake 15, an exhaust passage part 24 to circulate the flow of exhaust air of the motor-driven blower 11 to the side of the intake 15. As a reduction in the dust collecting performance is prevented by the centrifugal dust collecting part 14, and the heat of the exhaust passage part 24 is hardly propagated to air sucked in the suction pipe 23 by providing the suction pipe 23 approximately above the centrifugal dust collecting part 14 and the exhaust passage part 24 approximately below the centrifugal dust collecting part 14, it is possible to suppress a temperature increase in the motor-driven blower 11.

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PRIOR ART

[Description of the Prior Art] There are some which were indicated by JP,2000-5113,A as this kind of a vacuum cleaner, and it explains using drawing 13 .

[0003] It has the cord take-up motion 4 which rolls round a power cord 3 behind an electric blower 2 and said electric blower 2 behind a settling chamber 1, and the mouthpiece object 5 is connected with the settling chamber 1. Moreover, the vacuum cleaner bag 6 is arranged in the settling chamber 1.

[0004] As an arrow head shows in this drawing, dust is attracted by the electric blower 1 with air from the suction opening 7 of the mouthpiece object 5, and the attracted air passes along the flueway section 8 which penetrated the vacuum cleaner bag 6, passed through the interior of an electric blower 2, and was prepared in the lower part of a settling chamber 1, and circulates to the mouthpiece object 5.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the vacuum cleaner returns at least the part of the exhaust air style to a mouthpiece object, without discharging out of the body of a cleaner, and it was made to make circulate through it especially about the electrical machinery cleaner used at ordinary homes.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional configuration, while the dust of a up cleaned field was attracted and dust was collected with the vacuum cleaner bag 6 from the suction opening 7 of the mouthpiece object 5, since dust was collected for said dust to the suction direction of an electric blower 1, there was a problem that distribution of the dust for which dust is collected to said vacuum cleaner bag 6 was uneven, and a suction force tends to decline. [0006] This invention solves the above-mentioned conventional technical problem, and it aims at offering the vacuum cleaner which prevents the dust collection performance degradation by the fall of a suction force.

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MEANS

[Means for Solving the Problem] This invention is equipped with the absorption path section which opens for free passage the centrifugal dust removal section, the body of a cleaner which installs an electric blower inside, the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, and said centrifugal dust removal section and said suction opening, and the flueway section which makes the exhaust air wind of said electric blower flow back to said suction opening side in order to attain the above-mentioned purpose. According to this configuration, since the absorbed dust circles with a revolution style in the centrifugal dust removal section, distribution of dust can be good, and it can prevent that a suction force declines, and dust collection performance degradation can be prevented. If a suction force declines, the exhaust air airflow of an electric blower will fall, and by adopting the centrifugal dust removal section which prevents the fall of a suction force as mentioned above, the exhaust air airflow of an electric blower can also be secured and the suction performance degradation of the dust by the fall of the exhaust air airflow made to flow back to the inlet port side of a mouthpiece object can also be prevented.

[0008] Further, although the above-mentioned configuration is enough also as the suction performance degradation of dust about prevention, while preparing the aforementioned intake path section in the abbreviation upper part of said centrifugal dust removal section, by considering as the configuration which has prepared said flueway section in the abbreviation lower part of said centrifugal dust removal section, it controls that the inhalation of air which flows the intake path section by the thermal effect of the flueway section is warmed, and the temperature rise of the vacuum cleaner made to circulate through exhaust air can be controlled.

[0009]

[Embodiment of the Invention] The body of a cleaner with which invention of this invention according to claim 1 installs the centrifugal dust removal section and an electric blower inside, The absorption path section which opens the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, and said centrifugal dust removal section and said suction opening for free passage, While having the flueway section which makes the exhaust air wind of said electric blower flow back to said suction opening side and preparing the aforementioned intake path section in the abbreviation upper part of said centrifugal dust removal section, said flueway section is prepared in the abbreviation lower part of said centrifugal dust removal section. According to this configuration, since the absorbed dust circles with a revolution style in the centrifugal dust removal section, distribution of dust can be good, and it can prevent that a suction force declines, and dust collection performance degradation can be prevented. If a suction force declines, the exhaust air airflow of an electric blower will fall, and by adopting the centrifugal dust removal section which prevents the fall of a suction force as mentioned above, the exhaust air airflow of an electric blower can also be secured and the suction performance degradation of the dust by the fall of the exhaust air airflow made to flow back to the inlet port side of a mouthpiece object can also be prevented. Moreover, since said flueway section is prepared in the abbreviation lower part of said centrifugal dust removal section while preparing the aforementioned intake path section in the abbreviation upper part of said centrifugal dust removal section, it controls that the inhalation of air

which flows the intake path section by the thermal effect of the flueway section is warmed by dividing arrangement with the intake path section and the flueway section up and down, and performing it, and the temperature rise of the vacuum cleaner made to circulate through exhaust air can be controlled.

[0010] In invention of the claim 1 above-mentioned publication, it has a wrap case object for the intake path section, invention of this invention according to claim 2 is what used said case object as the handle which carries the centrifugal dust removal section, it expands an application, without using a case object vainly, and raises user-friendliness.

[0011] In invention of the claim 1 above-mentioned publication, invention of this invention according to claim 3 is what used a part of intake path section [at least] as the handle which carries said centrifugal dust removal section, can attain miniaturization further, and can raise lightweight-ization.

[0012] The body of a cleaner with which invention of this invention according to claim 4 installed the centrifugal dust removal section and an electric blower inside, The absorption path section which opens the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, and said centrifugal dust removal section and said suction opening for free passage, While having the flueway section which makes the exhaust air wind of said electric blower flow back to said suction opening side and preparing the aforementioned intake path section in the abbreviation lower part of said centrifugal dust removal section It has a wrap case object for the aforementioned intake path section, and it is what made the flueway section between said case object and the aforementioned intake path sections, and the top-face dimension of the body of a cleaner is made small, and miniaturization can be attained.

[0013] In invention given in any 1 term of above-mentioned claims 1-4, invention of this invention according to claim 5 is what prepared suction opening of a mouthpiece object, and the check valve formed in the connection with the intake path section from the spring material, and prevents dust ***** from suction opening of a mouthpiece object.

[0014] Invention of this invention according to claim 6 is what prepared the check valve formed from the spring material, and makes the inlet connection of the centrifugal dust removal section and the intake path section prevent dust **** of intake path circles, and the dust bank in invention given in any 1 term of above-mentioned claims 1-5.

[0015] In invention of the claim 6 above-mentioned publication, as for a check valve, invention of this invention according to claim 7 is what established the rotation core in the direction of inner circumference of the centrifugal dust removal section, can promote the rate of flow of the air which circles in the inner circumference of the centrifugal dust removal section, can remove the dust adhering to a filter etc., and can raise the dust collection engine performance.

[0016] The dust collection volume can be enlarged compared with the check valve configuration which stated invention of this invention according to claim 8 by invention of the claim 7 above-mentioned publication in invention of the claim 6 above-mentioned publication from the check valve having established the rotation core in the perpendicular direction to the direction of inner circumference of the centrifugal dust removal section.

[0017] While invention of this invention according to claim 9 can be freely rotated to the inlet connection of the centrifugal dust removal section and the intake path section, is formed in it from a spring material in invention given in any 1 term of above-mentioned claims 1-5 and has two or more wings It is what prepared a check valve which contacts the filter of said centrifugal dust removal circles in said blade tip, a filter can usually be struck by the busy condition, and the dust adhering to a filter can be removed, and clogging of a filter can be prevented, and the dust collection engine performance can be raised.

[0018] In invention given in any 1 term of above-mentioned claims 1-9, a case object is what constituted the curve configuration which has a lobe, and it becomes possible to be able to enlarge inhalation-of-air area of intake path circles, and to raise the dust collection engine performance of invention of this invention according to claim 10.

[0019] that to which, as for invention of this invention according to claim 11, the lobe of a case object is located in the abbreviation lower part of the body of a cleaner in invention of the claim 10 above-

mentioned publication -- it is -- appearance beauty -- disadvantage **** -- things are prevented.

[0020] Invention of this invention according to claim 12 is what formed the centrifugal dust removal section by the member containing an antistatic agent, and makes dust adhesion with static electricity by friction which air circles in the inner circumference of the centrifugal dust removal section prevent in invention given in any 1 term of above-mentioned claims 1-11.

[0021] invention of this invention according to claim 13 -- invention given in any 1 term of above-mentioned claims 1-12 -- setting -- a case object -- and -- or it is what formed the centrifugal dust removal section by the transparency member, and the amount of the dust which centrifugal dust removal circles absorbed is known, and user-friendliness improves.

[0022] Invention of this invention according to claim 14 is what prepared the flat part in the inside lower part of the centrifugal dust removal section in invention given in any 1 term of above-mentioned claims 1-13, and with gravity, without distributing the dust which collected by lower part **** of centrifugal dust removal circles, and the flat part, dust can make a piece place collect dust and can perform easily the activity which removes dust.

[0023] In invention of the claim 14 above-mentioned publication, invention of this invention according to claim 15 is what prepared the inlet connection of said centrifugal dust removal section and the intake path section in the flat part of the inside lower part of the centrifugal dust removal section, and the attached components and inlet connections of an inlet connection, such as a check valve, can be considered as a flat-surface design, a metal mold configuration becomes easy, and it can consist of simple configurations.

[0024] Invention of this invention according to claim 16 is what established the crevice in the inside of the centrifugal dust removal section in invention given in any 1 term of above-mentioned claims 1-15, said crevice can be covered with dust, such as a pebble, and the allophone generated while a pebble etc. circles can be made to control.

[0025] Invention of this invention according to claim 17 is a bore by the side of the intake path section which is open for free passage with suction opening of a mouthpiece object in invention given in any 1 term of above-mentioned claims 1-16, It is what was prepared smaller than the bore by the side of the centrifugal dust removal section and the intake path section open for free passage, and large dust can be prevented from entering into intake path circles, and can prevent dust **** of intake path circles.

[0026] Invention of this invention according to claim 18 is a bore by the side of the intake path section which is open for free passage with suction opening of a mouthpiece object in invention given in any 1 term of above-mentioned claims 1-17, It is what prepared heights, and small dust passes through intake path circles, and large dust ceases to enter into intake path circles, and can prevent dust **** of intake path circles.

[0027] In invention of the claim 18 above-mentioned publication, heights are ribs and invention of this invention according to claim 19 can form a lobe easily by low cost.

[0028] Invention of this invention according to claim 20 is constituted for the air induction pipe of a mouthpiece object in invention given in any 1 term of above-mentioned claims 1-19, enabling free rotation, and is what was considered as the configuration in which the body of a cleaner can be located in an abbreviation perpendicular direction to a up cleaned field. Big dust collects on the pars basilaris ossis occipitalis of the dust collection section with gravity, and by the dust collection section upper part by the side of an electric blower being covered, small dust can distribute dust and can obtain the high dust collection engine performance over a long period of time.

[0029] "In addition, The means for solving a technical problem described the basic configuration of this invention. The centrifugal dust removal section and the body of a cleaner which installs an electric blower inside, The absorption path section which opens the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, and said centrifugal dust removal section and said suction opening for free passage, Considering being the vacuum cleaner equipped with the flueway section which makes the exhaust air wind of said electric blower flow back to said suction opening side", the configuration of above-mentioned claims 1-20 is also combinable with this basic configuration suitably.

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EFFECT OF THE INVENTION

[Effect of the Invention] The body of a cleaner which installs the centrifugal dust removal section and an electric blower inside according to invention of this invention according to claim 1, The absorption path section which opens the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, and said centrifugal dust removal section and said suction opening for free passage, While having the flueway section which makes the exhaust air wind of said electric blower flow back to said suction opening side and preparing the aforementioned intake path section in the abbreviation upper part of said centrifugal dust removal section It is what prepared said flueway section in the abbreviation lower part of said centrifugal dust removal section, and the vacuum cleaner which prevents the dust collection performance degradation by the fall of a suction force can be offered.

[0062] According to invention of this invention according to claim 2, in invention of the claim 1 above-mentioned publication, it has a wrap case object for the intake path section, it is what used said case object as the handle which carries the centrifugal dust removal section, and an application is expanded, without using a case object vainly, and user-friendliness is raised.

[0063] According to invention of this invention according to claim 3, in invention of the claim 1 above-mentioned publication, it is what used a part of intake path section [at least] as the handle which carries said centrifugal dust removal section, miniaturization can be attained further, and lightweight-ization can be raised.

[0064] The body of a cleaner which installed the centrifugal dust removal section and an electric blower inside according to invention of this invention according to claim 4, The absorption path section which opens the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, and said centrifugal dust removal section and said suction opening for free passage, While having the flueway section which makes the exhaust air wind of said electric blower flow back to said suction opening side and preparing the aforementioned intake path section in the abbreviation lower part of said centrifugal dust removal section It has a wrap case object for the aforementioned intake path section, and it is what made the flueway section between said case object and the aforementioned intake path sections, and the top-face dimension of the body of a cleaner is made small, and miniaturization can be attained.

[0065] According to invention of this invention according to claim 5, in invention given in any 1 term of above-mentioned claims 1-4, it is what prepared suction opening of a mouthpiece object, and the check valve formed in the connection with the intake path section from the spring material, and dust ***** from suction opening of a mouthpiece object is prevented.

[0066] According to invention of this invention according to claim 6, it is what prepared the check valve formed from the spring material, and the inlet connection of the centrifugal dust removal section and the intake path section is made to prevent dust **** of intake path circles, and the dust bank in invention given in any 1 term of above-mentioned claims 1-5.

[0067] According to invention of this invention according to claim 7, in invention of the claim 6 above-mentioned publication, a check valve is what established the rotation core in the direction of inner circumference of the centrifugal dust removal section, can promote the rate of flow of the air which

circles in the inner circumference of the centrifugal dust removal section, can remove the dust adhering to a filter etc., and can raise the dust collection engine performance.

[0068] According to invention of this invention according to claim 8, in invention of the claim 6 above-mentioned publication, a check valve can enlarge the dust collection volume compared with the check valve configuration stated by invention of the claim 7 above-mentioned publication from having established the rotation core in the perpendicular direction to the direction of inner circumference of the centrifugal dust removal section.

[0069] While according to invention of this invention according to claim 9 being able to rotate to the inlet connection of the centrifugal dust removal section and the intake path section freely, being formed in it from a spring material in invention given in any 1 term of above-mentioned claims 1-5 and having two or more wings It is what prepared a check valve which contacts the filter of said centrifugal dust removal circles in said blade tip, a filter can usually be struck by the busy condition, and the dust adhering to a filter can be removed, and clogging of a filter can be prevented, and the dust collection engine performance can be raised.

[0070] According to invention of this invention according to claim 10, in invention given in any 1 term of above-mentioned claims 1-9, a case object is what constituted the curve configuration which has a lobe, and it becomes possible to be able to enlarge inhalation-of-air area within absorption, and to raise the dust collection engine performance of it.

[0071] that to which the lobe of a case object is located in the abbreviation lower part of the body of a cleaner in invention of the claim 10 above-mentioned publication according to invention of this invention according to claim 11 -- it is -- appearance beauty -- disadvantage **** -- things are prevented.

[0072] According to invention of this invention according to claim 12, it is what formed the centrifugal dust removal section by the member containing an antistatic agent, and dust adhesion with static electricity by friction which air circles in the inner circumference of the centrifugal dust removal section is made to prevent in invention given in any 1 term of above-mentioned claims 1-11.

[0073] according to invention of this invention according to claim 13 -- invention given in any 1 term of above-mentioned claims 1-12 -- setting -- a case object -- and -- or it is what formed the centrifugal dust removal section by the transparence member, and the amount of the dust which centrifugal dust removal circles absorbed is known, and user-friendliness improves.

[0074] According to invention of this invention according to claim 14, in invention given in any 1 term of above-mentioned claims 1-13, it is what prepared the flat part in the inside lower part of the centrifugal dust removal section, and without distributing the dust which collected by lower part **** of centrifugal dust removal circles, and the flat part, dust can make a piece place collect dust and can perform easily the activity which removes dust with gravity.

[0075] According to invention of this invention according to claim 15, in invention of the claim 14 above-mentioned publication, it is what prepared the inlet connection of said centrifugal dust removal section and the intake path section in the flat part at the inside lower part of the centrifugal dust removal section, and a metal mold configuration becomes easy and a simple configuration can constitute from considering the attached components and inlet connections of an inlet connection, such as a check valve, as a flat-surface design.

[0076] According to invention of this invention according to claim 16, it is what established the crevice in the inside of the centrifugal dust removal section, said crevice can be covered with dust, such as a pebble, and the allophone generated while a pebble etc. circles can be made to control in invention given in any 1 term of above-mentioned claims 1-15.

[0077] According to invention of this invention according to claim 17, it is what prepared smaller than the bore by the side of the centrifugal dust removal section and the intake path section open for free passage the bore by the side of the intake path section which is open for free passage with suction opening of a mouthpiece object in invention given in any 1 term of above-mentioned claims 1-16, and large dust can be prevented from entering in a tail pipe, and can prevent dust **** of intake path circles.

[0078] According to invention of this invention according to claim 18, it is what prepared heights in the

bore by the side of the intake path section which is open for free passage with suction opening of a mouthpiece object in invention given in any 1 term of above-mentioned claims 1-17, and small dust passes through intake path circles, and large dust ceases to enter into intake path circles, and can prevent dust **** of intake path circles.

[0079] According to invention of this invention according to claim 19, in invention of the claim 18 above-mentioned publication, heights are ribs, and a lobe can be easily formed by low cost.

[0080] According to invention of this invention according to claim 20, the air induction pipe of a mouthpiece object is constituted in invention given in any 1 term of above-mentioned claims 1-19, enabling free rotation, and the body of a cleaner is what was considered as the configuration which can be located in an abbreviation perpendicular direction to a up cleaned field. Big dust collects on the pars basilaris ossis occipitalis of the dust collection section with gravity, and by the dust collection section upper part by the side of an electric blower being covered, small dust can distribute dust and can obtain the high dust collection engine performance over a long period of time.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The side-face sectional view of the vacuum cleaner in which the 1st example of this invention is shown

[Drawing 2] The A-A sectional view of drawing 1

[Drawing 3] the part which rotated the centrifugal dust removal section of the vacuum cleaner in which the 1st example of this invention is shown -- a fracture side elevation

[Drawing 4] The sectional view which prepared the notching section in the case object of this vacuum cleaner

[Drawing 5] The side-face sectional view of the vacuum cleaner in which the 2nd example of this invention is shown

[Drawing 6] The B-B sectional view of drawing 5

[Drawing 7] The important section sectional view of the vacuum cleaner in which the 2nd example of this invention is shown

[Drawing 8] The important section sectional view showing rotation actuation of the check valve of this vacuum cleaner

[Drawing 9] The sectional view showing rotation actuation of the check valve in which the wing of this vacuum cleaner was arranged

[Drawing 10] The sectional view of the vacuum cleaner in which the 3rd example of this invention is shown

[Drawing 11] The important section sectional view of the vacuum cleaner in which the 4th example of this invention is shown

[Drawing 12] The side-face sectional view of the vacuum cleaner of the 5th example of this invention

[Drawing 13] The sectional side elevation of the conventional vacuum cleaner

[Description of Notations]

10 Body of Cleaner

11 Electric Blower

14 Centrifugal Dust Removal Section

15 Suction Opening

16 Mouthpiece Object

22 Filter

23 Tail Pipe (Intake Path Section)

24 Flueway Section

25 Case Object

29 Handle

30 Notching Section

31 Check Valve

31a Rotation core

33 Wing

35 Inlet Connection
35a Air entry
36 Curve Configuration
37 Lobe
38 Flat Part
39 Crevice
40 Dust Uptake Room
41 Convex Rib
42 Air Induction Pipe

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the vacuum cleaner returns at least the part of the exhaust air style to a mouthpiece object, without discharging out of the body of a cleaner, and it was made to make circulate through it especially about the electrical machinery cleaner used at ordinary homes.

[0002]

[Description of the Prior Art] There are some which were indicated by JP,2000-5113,A as this kind of a vacuum cleaner, and it explains using drawing 13 .

[0003] It has the cord take-up motion 4 which rolls round a power cord 3 behind an electric blower 2 and said electric blower 2 behind a settling chamber 1, and the mouthpiece object 5 is connected with the settling chamber 1. Moreover, the vacuum cleaner bag 6 is arranged in the settling chamber 1.

[0004] As an arrow head shows in this drawing, dust is attracted by the electric blower 1 with air from the suction opening 7 of the mouthpiece object 5, and the attracted air passes along the flueway section 8 which penetrated the vacuum cleaner bag 6, passed through the interior of an electric blower 2, and was prepared in the lower part of a settling chamber 1, and circulates to the mouthpiece object 5.

[0005]

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional configuration, while the dust of a up cleaned field was attracted and dust was collected with the vacuum cleaner bag 6 from the suction opening 7 of the mouthpiece object 5, since dust was collected for said dust to the suction direction of an electric blower 1, there was a problem that distribution of the dust for which dust is collected to said vacuum cleaner bag 6 was uneven, and a suction force tends to decline.

[0006] This invention solves the above-mentioned conventional technical problem, and it aims at offering the vacuum cleaner which prevents the dust collection performance degradation by the fall of a suction force.

[0007]

[Means for Solving the Problem] This invention is equipped with the absorption path section which opens for free passage the centrifugal dust removal section, the body of a cleaner which installs an electric blower inside, the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, and said centrifugal dust removal section and said suction opening, and the flueway section which makes the exhaust air wind of said electric blower flow back to said suction opening side in order to attain the above-mentioned purpose. According to this configuration, since the absorbed dust circles with a revolution style in the centrifugal dust removal section, distribution of dust can be good, and it can prevent that a suction force declines, and dust collection performance degradation can be prevented. If a suction force declines, the exhaust air airflow of an electric blower will fall, and by adopting the centrifugal dust removal section which prevents the fall of a suction force as mentioned above, the exhaust air airflow of an electric blower can also be secured and the suction performance degradation of the dust by the fall of the exhaust air airflow made to flow back to the inlet port side of a

mouthpiece object can also be prevented.

[0008] Further, although the above-mentioned configuration is enough also as the suction performance degradation of dust about prevention, while preparing the aforementioned intake path section in the abbreviation upper part of said centrifugal dust removal section, by considering as the configuration which has prepared said flueway section in the abbreviation lower part of said centrifugal dust removal section, it controls that the inhalation of air which flows the intake path section by the thermal effect of the flueway section is warmed, and the temperature rise of the vacuum cleaner made to circulate through exhaust air can be controlled.

[0009]

[Embodiment of the Invention] The body of a cleaner with which invention of this invention according to claim 1 installs the centrifugal dust removal section and an electric blower inside, The absorption path section which opens the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, and said centrifugal dust removal section and said suction opening for free passage, While having the flueway section which makes the exhaust air wind of said electric blower flow back to said suction opening side and preparing the aforementioned intake path section in the abbreviation upper part of said centrifugal dust removal section, said flueway section is prepared in the abbreviation lower part of said centrifugal dust removal section. According to this configuration, since the absorbed dust circles with a revolution style in the centrifugal dust removal section, distribution of dust can be good, and it can prevent that a suction force declines, and dust collection performance degradation can be prevented. If a suction force declines, the exhaust air airflow of an electric blower will fall, and by adopting the centrifugal dust removal section which prevents the fall of a suction force as mentioned above, the exhaust air airflow of an electric blower can also be secured and the suction performance degradation of the dust by the fall of the exhaust air airflow made to flow back to the inlet port side of a mouthpiece object can also be prevented. Moreover, since said flueway section is prepared in the abbreviation lower part of said centrifugal dust removal section while preparing the aforementioned intake path section in the abbreviation upper part of said centrifugal dust removal section, it controls that the inhalation of air which flows the intake path section by the thermal effect of the flueway section is warmed by dividing arrangement with the intake path section and the flueway section up and down, and performing it, and the temperature rise of the vacuum cleaner made to circulate through exhaust air can be controlled.

[0010] In invention of the claim 1 above-mentioned publication, it has a wrap case object for the intake path section, invention of this invention according to claim 2 is what used said case object as the handle which carries the centrifugal dust removal section, it expands an application, without using a case object vainly, and raises user-friendliness.

[0011] In invention of the claim 1 above-mentioned publication, invention of this invention according to claim 3 is what used a part of intake path section [at least] as the handle which carries said centrifugal dust removal section, can attain miniaturization further, and can raise lightweight-ization.

[0012] The body of a cleaner with which invention of this invention according to claim 4 installed the centrifugal dust removal section and an electric blower inside, The absorption path section which opens the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, and said centrifugal dust removal section and said suction opening for free passage, While having the flueway section which makes the exhaust air wind of said electric blower flow back to said suction opening side and preparing the aforementioned intake path section in the abbreviation lower part of said centrifugal dust removal section It has a wrap case object for the aforementioned intake path section, and it is what made the flueway section between said case object and the aforementioned intake path sections, and the top-face dimension of the body of a cleaner is made small, and miniaturization can be attained.

[0013] In invention given in any 1 term of above-mentioned claims 1-4, invention of this invention according to claim 5 is what prepared suction opening of a mouthpiece object, and the check valve formed in the connection with the intake path section from the spring material, and prevents dust ***** from suction opening of a mouthpiece object.

[0014] Invention of this invention according to claim 6 is what prepared the check valve formed from

the spring material, and makes the inlet connection of the centrifugal dust removal section and the intake path section prevent dust **** of intake path circles, and the dust bank in invention given in any 1 term of above-mentioned claims 1-5.

[0015] In invention of the claim 6 above-mentioned publication, as for a check valve, invention of this invention according to claim 7 is what established the rotation core in the direction of inner circumference of the centrifugal dust removal section, can promote the rate of flow of the air which circles in the inner circumference of the centrifugal dust removal section, can remove the dust adhering to a filter etc., and can raise the dust collection engine performance.

[0016] The dust collection volume can be enlarged compared with the check valve configuration which stated invention of this invention according to claim 8 by invention of the claim 7 above-mentioned publication in invention of the claim 6 above-mentioned publication from the check valve having established the rotation core in the perpendicular direction to the direction of inner circumference of the centrifugal dust removal section.

[0017] While invention of this invention according to claim 9 can be freely rotated to the inlet connection of the centrifugal dust removal section and the intake path section, is formed in it from a spring material in invention given in any 1 term of above-mentioned claims 1-5 and has two or more wings It is what prepared a check valve which contacts the filter of said centrifugal dust removal circles in said blade tip, a filter can usually be struck by the busy condition, and the dust adhering to a filter can be removed, and clogging of a filter can be prevented, and the dust collection engine performance can be raised.

[0018] In invention given in any 1 term of above-mentioned claims 1-9, a case object is what constituted the curve configuration which has a lobe, and it becomes possible to be able to enlarge inhalation-of-air area of intake path circles, and to raise the dust collection engine performance of invention of this invention according to claim 10.

[0019] that to which, as for invention of this invention according to claim 11, the lobe of a case object is located in the abbreviation lower part of the body of a cleaner in invention of the claim 10 above-mentioned publication -- it is -- appearance beauty -- disadvantage **** -- things are prevented.

[0020] Invention of this invention according to claim 12 is what formed the centrifugal dust removal section by the member containing an antistatic agent, and makes dust adhesion with static electricity by friction which air circles in the inner circumference of the centrifugal dust removal section prevent in invention given in any 1 term of above-mentioned claims 1-11.

[0021] invention of this invention according to claim 13 -- invention given in any 1 term of above-mentioned claims 1-12 -- setting -- a case object -- and -- or it is what formed the centrifugal dust removal section by the transparence member, and the amount of the dust which centrifugal dust removal circles absorbed is known, and user-friendliness improves.

[0022] Invention of this invention according to claim 14 is what prepared the flat part in the inside lower part of the centrifugal dust removal section in invention given in any 1 term of above-mentioned claims 1-13, and with gravity, without distributing the dust which collected by lower part **** of centrifugal dust removal circles, and the flat part, dust can make a piece place collect dust and can perform easily the activity which removes dust.

[0023] In invention of the claim 14 above-mentioned publication, invention of this invention according to claim 15 is what prepared the inlet connection of said centrifugal dust removal section and the intake path section in the flat part of the inside lower part of the centrifugal dust removal section, and the attached components and inlet connections of an inlet connection, such as a check valve, can be considered as a flat-surface design, a metal mold configuration becomes easy, and it can consist of simple configurations.

[0024] Invention of this invention according to claim 16 is what established the crevice in the inside of the centrifugal dust removal section in invention given in any 1 term of above-mentioned claims 1-15, said crevice can be covered with dust, such as a pebble, and the allophone generated while a pebble etc. circles can be made to control.

[0025] Invention of this invention according to claim 17 is a bore by the side of the intake path section

which is open for free passage with suction opening of a mouthpiece object in invention given in any 1 term of above-mentioned claims 1-16, It is what was prepared smaller than the bore by the side of the centrifugal dust removal section and the intake path section open for free passage, and large dust can be prevented from entering into intake path circles, and can prevent dust **** of intake path circles.

[0026] Invention of this invention according to claim 18 is a bore by the side of the intake path section which is open for free passage with suction opening of a mouthpiece object in invention given in any 1 term of above-mentioned claims 1-17, It is what prepared heights, and small dust passes through intake path circles, and large dust ceases to enter into intake path circles, and can prevent dust **** of intake path circles.

[0027] In invention of the claim 18 above-mentioned publication, heights are ribs and invention of this invention according to claim 19 can form a lobe easily by low cost.

[0028] Invention of this invention according to claim 20 is constituted for the air induction pipe of a mouthpiece object in invention given in any 1 term of above-mentioned claims 1-19, enabling free rotation, and is what was considered as the configuration in which the body of a cleaner can be located in an abbreviation perpendicular direction to a up cleaned field. Big dust collects on the pars basilaris ossis occipitalis of the dust collection section with gravity, and by the dust collection section upper part by the side of an electric blower being covered, small dust can distribute dust and can obtain the high dust collection engine performance over a long period of time.

[0029] "In addition, The means for solving a technical problem described the basic configuration of this invention. The centrifugal dust removal section and the body of a cleaner which installs an electric blower inside, The absorption path section which opens the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, and said centrifugal dust removal section and said suction opening for free passage, Considering being the vacuum cleaner equipped with the flueway section which makes the exhaust air wind of said electric blower flow back to said suction opening side", the configuration of above-mentioned claims 1-20 is also combinable with this basic configuration suitably.

[0030]

[Example] Hereafter, the example of this invention is explained using a drawing.

[0031] (Example 1) Drawing 1 is the side-face sectional view of the vacuum cleaner of the 1st example of this invention, and drawing 2 is the A-A sectional view of drawing 1. Drawing 3 is the Fig. of operation made to rotate the centrifugal dust removal section of this vacuum cleaner. Drawing 4 is the sectional view which prepared the notching section in the case object of this vacuum cleaner.

[0032] The body 10 of a cleaner contains the electric blower 11 which generates a suction force, and cord reel equipment 12 is contained by the periphery of an electric blower 11. The handle section 13 is formed in the upper part of the body 10 of a cleaner, and it can move with the body 10 of a cleaner from supporting this handle section 13. The centrifugal dust removal section 14 possesses ahead of the body 10 of a cleaner, and the mouthpiece object 16 equipped with the absorption opening 15 ahead of the centrifugal dust removal section 14 is established. The mouthpiece object 16 is connected with the end connection 17 prepared ahead of the centrifugal dust removal section 14 free [attachment and detachment], and the end connection 17 is formed in an approximately cylindrical major diameter 18 and an approximately cylindrical narrow diameter portion 19, and constituted double tubing.

[0033] The dust box 21 formed in the shape of [which the centrifugal dust removal section 14 collects dust for the dust from the mouthpiece object 16, and formed the inlet 20] a cup, To the periphery side of the dust box 21 which filters 22 which prevent invasion of dust were consisted of, and was formed in the shape of a cup The case object 25 for forming maintenance and the flueway section 24 of a tail pipe (equivalent to the intake path section) 23 is arranged, and the case object 25 consists of two components on either side, and is stopped by the dust box 21, the screw, pawl fitting, etc. (not shown). The dust which flowed into the dust box 21 from the tail pipe 23 flows with the revolution style which meets the inner skin of a dust box 21, and dust has stopped being able to adhere to a filter 22 side easily. Although dust tends to collect on the inner skin lower part of a dust box 21 when the centrifugal dust removal section 14 is carried out especially every width, the dust which is that a revolution style occurs with

suction actuation and which had collected the grade is also stirred, and absorption performance degradation can be controlled.

[0034] Moreover, the tail pipe 23 is arranged in the top-face cross direction center section of the dust box 21. The air inhaled from the suction opening 15 of the mouthpiece object 16 It passes along the narrow diameter portion 19 of an end connection 17, and the tail pipe 23 opened for free passage, and dust is collected to a dust box 21. Further the exhaust air wind from an electric blower 11 It passes along the electric-blower 11 bottom, and the flueway section 24 formed with the case object 24 in the inferior-surface-of-tongue cross direction center section of the dust box 21 is opened for free passage, and again, it is returned to the mouthpiece object 16 through between the major diameter 18 of an end connection 17, and narrow diameter portions 19, and is.

[0035] The operation by the above-mentioned configuration is as follows. Since miniaturization can be attained in a small tooth space and an inlet 20 is in the dust box 21 bottom further from forming a tail pipe 23 in the abbreviation top-face cross direction center section of the dust box 21 formed approximately cylindrical, and locating the flueway section 24 in the abbreviation inferior-surface-of-tongue cross direction center section of the dust box 21, dust moves to the inferior surface of tongue of a dust box 21 by self-weight, and dust **** in an inlet 20 is prevented.

[0036] next, drawing 2 and drawing 3 -- being, the body 10 of a cleaner and the centrifugal dust removal section 14 have the composition of having separated, and the convex rib 27 prepared in the case object 24 of the centrifugal dust removal section 14 enters into the concave invitation section 26 in which the body 10 of a cleaner was formed caudad, and the centrifugal dust removal section 14 stops the centrifugal dust removal section 14, and consists of buckles 28 prepared above the body 10 of a cleaner free [attachment and detachment]. Moreover, the case object 25 by which method formation of a wrap was carried out in the tail pipe 23 arranged in the abbreviation top-face cross direction center section of the dust box 21 is used as a handle 29, and it is constituted so that the centrifugal dust removal section 14 can be carried. Improvement in workability can be aimed at from being able to use the lug of the case object 25 effectively and carrying the centrifugal dust removal section 14 by the ability of a tail pipe 23 being used for the handle 29 which carries the centrifugal dust removal section 14 for the wrap case object 25.

[0037] Moreover, in drawing 4 , the notching section 30 is formed in the case object 25 which was arranged in the abbreviation top-face cross direction center section of the dust box 21 and by which method formation of a wrap was carried out in the tail pipe 23, and the tail pipe 23 exposed from this notching section 30 is used as a handle 29, and it is constituted so that the centrifugal dust removal section 14 can be carried. Since the tail pipe 23 which forms the notching section 30 in the wrap case object 25, and projects a tail pipe 23 from this notching section 30 can be used for the handle 29 which carries the centrifugal dust removal section 14, miniaturization can be attained further and lightweightization can be raised.

[0038] (Example 2) Next, the 2nd example of this invention is explained using drawing 5 - drawing 9 .

[0039] Drawing 5 is the side-face sectional view of the vacuum cleaner in which the 2nd example of this invention is shown, and drawing 6 is the B-B sectional view of drawing 5 . Drawing 7 is the partial enlarged drawing of the vacuum cleaner in which the 2nd example is shown, and drawing 8 is the partial enlarged drawing showing rotation actuation of the check valve of the vacuum cleaner in which the 2nd example is shown. Drawing 9 is the partial enlarged drawing showing rotation actuation of the check valve in which the wing of the vacuum cleaner in which the 2nd example is shown was arranged. In addition, the same sign is attached about the same component part as the 1st example of the above, and the explanation is omitted.

[0040] It consists of a dust box 21 formed in the shape of [which formed the inlet 20] a cup, and a filter 22 which prevents invasion of dust, and the tail pipe 23 is arranged in the abbreviation inferior-surface-of-tongue cross direction center section of the dust box 21 formed in the shape of a cup, and this tail pipe 23 is covered with the components of the case object 25, and is stopped by the dust box 21, the screw, pawl fitting, etc. (not shown). Since the flueway section 24 is formed, the dimension of the height direction of the body 10 of a cleaner can be small used as a compact between the periphery of a tail pipe

23, and the inside of the case object 25, and it raises appearance beauty.

[0041] Moreover, in drawing 5 and drawing 6, by the inlet connection 35 between the inlet 20 formed in the dust box 21, and the narrow diameter portion 19 of an end connection 17 and the tail pipe 23 opened for free passage, air entry 35a from this inlet connection 35 is countered, the curve configuration 36 is made and the lobe 37 which projects in the down side of ten outside the body of a cleaner is formed [object / 25 / wrap case] in the tail pipe 23. While being able to come the air course area in a tail pipe 23 by the inlet connection 35 between the inlet 20 formed in the dust box 21, and a tail pipe 23 size and reducing air course resistance by it, even if it gets the worst and dust blocked in an inlet connection, since air course area is large, it becomes possible to remove easily by hand.

[0042] In drawing 6, moreover, between the inlet 20 formed in the dust box 21, and the narrow diameter portion 19 of an end connection 17 and the tail pipe 23 opened for free passage The check valve 31 formed from the spring material is arranged, and it gets down. This check valve 31 Rotation core 31a is prepared in the end of the direction of inner circumference of a dust box 21, and with this rotation core 31a as the starting point, the check valve 31 is formed so that it may open and close in the direction of inner circumference of a dust box 21, as an arrow head shows. The rate of flow to which air circles in the inner circumference of a dust box 21 is promoted, the centrifugal-force effectiveness can be demonstrated, the dust adhering to a filter etc. can be removed, and the dust collection engine performance can be raised. By the inlet 20 formed in the dust box 21 and the inlet 20 formed in the dust box 21 by the inlet connection 35 between tail pipes 23 being formed by the flat part 38, it becomes possible to consider the inlet 20 formed in the attached components and dust box 21 of check valve 31 grade, and the edge of a tail pipe 23 as a flat-surface design, and a design that a metal mold configuration is easy and cheap can be performed.

[0043] Moreover, in drawing 6 and drawing 7, the check valve 31 formed from the spring material between the inlet 20 formed in the dust box 21, and the narrow diameter portion 19 of an end connection 17 and the tail pipe 23 opened for free passage is arranged, it gets down, and this check valve 31 is stopped by press fit fitting with the inlet 20 of a dust box 21, and the tail pipe 23. Even if it moves the body 10 of a cleaner in all the directions, dust **** in a tail pipe 23 and the dust bank can be made to prevent.

[0044] In drawing 7, the check valve 31 formed from the spring material which prevents ***** of the dust by which fitting was carried out to the inside of a narrow diameter portion 19 between the suction opening 15 of the mouthpiece object 16, and the narrow diameter portion 19 of an end connection 17 and the tail pipe 23 opened for free passage is arranged. Even if it moves the body 10 of a cleaner in all the directions, dust ***** from the suction opening 15 of the mouthpiece object 16 is prevented. Moreover, since the antistatic agent is contained into the ingredient of dust box 21 grade, the dust adhesion by static electricity and electrification by friction to which air circles in the inner circumference of the centrifugal dust removal section 14 is made to prevent with the components which constitute the centrifugal dust removal section 14. Furthermore, with the components which constitute the centrifugal dust removal section 14, since the ingredient of dust box 21 grade is constituted in transparence, with the components which constitute the centrifugal dust removal section 14, the amount of the dust absorbed in the centrifugal dust removal section 14 is known, and user-friendliness improves from making it dust box 21 grade and transparence. Moreover, since the flat part 38 is formed under the body 10 of a cleaner, if an electric blower 11 stops by the inside of the approximately cylindrical dust box 21, dust will be accumulated in the flat part 38 in which the dust box 21 prepared dust caudad within the centrifugal dust removal section 14 with gravity at homogeneity, and this flat part 38 can be made to collect dust, and the activity which removes dust can be performed easily.

[0045] In drawing 8, moreover, between the inlet 20 formed in the dust box 21, and the narrow diameter portion 19 of an end connection 17 and the tail pipe 23 opened for free passage The check valve 31 formed from the spring material is arranged, and it gets down. This check valve 31 Rotation core 31a is prepared in the end of a perpendicular direction to the direction of inner circumference of a dust box 21, and with this rotation core 31a as the starting point, the check valve 31 is formed so that it may open and close in the perpendicular direction to the direction of dust box 21 inner circumference, as an arrow head

shows. Although the dust collection volume in a dust box 21 is usually equivalent to L to the edge of an inlet 20, it can lengthen the part of closing motion, and L1 and distance in the perpendicular direction to the direction of inner circumference of a dust box 21, can enlarge the dust collection volume, and raises the engine performance.

[0046] In drawing 9, next, between the inlet 20 formed in the dust box 21, and the narrow diameter portion 19 of an end connection 17 and the tail pipe 23 opened for free passage A check valve 31 is arranged, it gets down, and two or more wings 33 formed in the cylinder-like pivot 32 from the spring material possess the configuration of this check valve 31, and the both ends of the cylinder-like pivot 32 are supported by the wall 34 formed from the dust box 21, and are constituted free [rotation]. A wing 33 rotates with the suction force of an electric blower 11, and rotation of a check valve 31 is attained, and it is further arranged in the location which contacts the filter 22 in the centrifugal dust removal section 14 in the tip of this wing 33. While the wing 33 of a check valve 31 rotates with the suction force of an electric blower 11, a filter 22 can be struck, the dust adhering to a filter 22 can be removed, and clogging of a filter 22 can be prevented, and the dust collection engine performance can be raised.

[0047] (Example 3) Next, the 3rd example of this invention is explained using drawing 10.

[0048] Drawing 10 is the sectional view of the vacuum cleaner in which the 3rd example of this invention is shown. In addition, since the thing of the same sign as said example has the same structure, explanation is omitted.

[0049] In the lower part of the dust box 21 formed approximately cylindrical, the dust uptake room 40 where the crevice 39 was formed in the inside is formed.

[0050] The operation by the above-mentioned configuration is as follows.

[0051] When air circles in the inner circumference of a dust box 21, the dust uptake room 40 is covered with heavy dust, such as a pebble, and small dust circles in the inner circumference of a dust box 21. The allophone generated by this while a pebble etc. circles is made to control, and it is made to prevent with [in a dust box 21] a blemish.

[0052] (Example 4) Next, the 4th example of this invention is explained using drawing 11.

[0053] Drawing 11 is the partial enlarged drawing of the vacuum cleaner in which the 4th example of this invention is shown. In addition, since the thing of the same sign as said example has the same structure, explanation is omitted.

[0054] It is prepared smaller than the bore by the side of the tail pipe 23 which opens the inlet 20 formed in the dust box 21, the narrow diameter portion 19 of an end connection 17, and the bore by the side of the tail pipe 23 which is open for free passage with the narrow diameter portion 19 of an end connection 17 at the tail pipe 23 opened for free passage for free passage with the inlet 20 formed in the dust box 21, and since large dust stops being able to enter easily in a tail pipe 23, it can prevent dust **** in a tail pipe 23.

[0055] Moreover, with the inlet 20 formed in the dust box 21, the narrow diameter portion 19 of an end connection 17, and the tail pipe 23 opened for free passage, the convex rib 41 which is a lobe is formed in the narrow diameter portion 19 of an end connection 17, and the bore by the side of the tail pipe 23 open for free passage, small dust passes through the inside of a tail pipe 23, and large dust ceases to enter in a tail pipe 23, and can prevent dust **** in a tail pipe 23.

[0056] (Example 5) Next, the 5th example of this invention is explained using drawing 12.

[0057] Drawing 12 is the side-face sectional view which used as the vertical mold the body of a cleaner in which the 6th example of this invention is shown. Since the thing of the same sign as said example has the same structure, explanation is omitted.

[0058] The suction opening 15 of the mouthpiece object 16 and the air induction pipe 42 which was open for free passage are constituted enabling the free mouthpiece object 16 and rotation, and it is constituted so that the body 10 of a cleaner can use it, making it located in the abbreviation perpendicular direction of a up cleaned field.

[0059] The operation by the above-mentioned configuration is as follows.

[0060] When the body 10 of a cleaner is stood almost perpendicularly to a up cleaned field, the centrifugal dust removal section 14 is located under the electric blower 11, big dust collects on the pars

basilaris ossis occipitalis of a dust box 21 with gravity, small dust is attracted by the electric-blower 11 side in the upper part of a dust box 21, and only very detailed dust adheres to a filter 22. That is, it becomes possible to separate into size, dust plugging of the dust cannot be carried out, and the high dust collection engine performance can be obtained over a long period of time.

[0061]

[Effect of the Invention] The body of a cleaner which installs the centrifugal dust removal section and an electric blower inside according to invention of this invention according to claim 1, The absorption path section which opens the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, and said centrifugal dust removal section and said suction opening for free passage, While having the flueway section which makes the exhaust air wind of said electric blower flow back to said suction opening side and preparing the aforementioned intake path section in the abbreviation upper part of said centrifugal dust removal section It is what prepared said flueway section in the abbreviation lower part of said centrifugal dust removal section, and the vacuum cleaner which prevents the dust collection performance degradation by the fall of a suction force can be offered.

[0062] According to invention of this invention according to claim 2, in invention of the claim 1 above-mentioned publication, it has a wrap case object for the intake path section, it is what used said case object as the handle which carries the centrifugal dust removal section, and an application is expanded, without using a case object vainly, and user-friendliness is raised.

[0063] According to invention of this invention according to claim 3, in invention of the claim 1 above-mentioned publication, it is what used a part of intake path section [at least] as the handle which carries said centrifugal dust removal section, miniaturization can be attained further, and lightweight-ization can be raised.

[0064] The body of a cleaner which installed the centrifugal dust removal section and an electric blower inside according to invention of this invention according to claim 4, The absorption path section which opens the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, and said centrifugal dust removal section and said suction opening for free passage, While having the flueway section which makes the exhaust air wind of said electric blower flow back to said suction opening side and preparing the aforementioned intake path section in the abbreviation lower part of said centrifugal dust removal section It has a wrap case object for the aforementioned intake path section, and it is what made the flueway section between said case object and the aforementioned intake path sections, and the top-face dimension of the body of a cleaner is made small, and miniaturization can be attained.

[0065] According to invention of this invention according to claim 5, in invention given in any 1 term of above-mentioned claims 1-4, it is what prepared suction opening of a mouthpiece object, and the check valve formed in the connection with the intake path section from the spring material, and dust ***** from suction opening of a mouthpiece object is prevented.

[0066] According to invention of this invention according to claim 6, it is what prepared the check valve formed from the spring material, and the inlet connection of the centrifugal dust removal section and the intake path section is made to prevent dust **** of intake path circles, and the dust bank in invention given in any 1 term of above-mentioned claims 1-5.

[0067] According to invention of this invention according to claim 7, in invention of the claim 6 above-mentioned publication, a check valve is what established the rotation core in the direction of inner circumference of the centrifugal dust removal section, can promote the rate of flow of the air which circles in the inner circumference of the centrifugal dust removal section, can remove the dust adhering to a filter etc., and can raise the dust collection engine performance.

[0068] According to invention of this invention according to claim 8, in invention of the claim 6 above-mentioned publication, a check valve can enlarge the dust collection volume compared with the check valve configuration stated by invention of the claim 7 above-mentioned publication from having established the rotation core in the perpendicular direction to the direction of inner circumference of the centrifugal dust removal section.

[0069] While according to invention of this invention according to claim 9 being able to rotate to the

inlet connection of the centrifugal dust removal section and the intake path section freely, being formed in it from a spring material in invention given in any 1 term of above-mentioned claims 1-5 and having two or more wings. It is what prepared a check valve which contacts the filter of said centrifugal dust removal circles in said blade tip, a filter can usually be struck by the busy condition, and the dust adhering to a filter can be removed, and clogging of a filter can be prevented, and the dust collection engine performance can be raised.

[0070] According to invention of this invention according to claim 10, in invention given in any 1 term of above-mentioned claims 1-9, a case object is what constituted the curve configuration which has a lobe, and it becomes possible to be able to enlarge inhalation-of-air area within absorption, and to raise the dust collection engine performance of it.

[0071] that to which the lobe of a case object is located in the abbreviation lower part of the body of a cleaner in invention of the claim 10 above-mentioned publication according to invention of this invention according to claim 11 -- it is -- appearance beauty -- disadvantage **** -- things are prevented.

[0072] According to invention of this invention according to claim 12, it is what formed the centrifugal dust removal section by the member containing an antistatic agent, and dust adhesion with static electricity by friction which air circles in the inner circumference of the centrifugal dust removal section is made to prevent in invention given in any 1 term of above-mentioned claims 1-11.

[0073] according to invention of this invention according to claim 13 -- invention given in any 1 term of above-mentioned claims 1-12 -- setting -- a case object -- and -- or it is what formed the centrifugal dust removal section by the transparency member, and the amount of the dust which centrifugal dust removal circles absorbed is known, and user-friendliness improves.

[0074] According to invention of this invention according to claim 14, in invention given in any 1 term of above-mentioned claims 1-13, it is what prepared the flat part in the inside lower part of the centrifugal dust removal section, and without distributing the dust which collected by lower part **** of centrifugal dust removal circles, and the flat part, dust can make a piece place collect dust and can perform easily the activity which removes dust with gravity.

[0075] According to invention of this invention according to claim 15, in invention of the claim 14 above-mentioned publication, it is what prepared the inlet connection of said centrifugal dust removal section and the intake path section in the flat part at the inside lower part of the centrifugal dust removal section, and a metal mold configuration becomes easy and a simple configuration can constitute from considering the attached components and inlet connections of an inlet connection, such as a check valve, as a flat-surface design.

[0076] According to invention of this invention according to claim 16, it is what established the crevice in the inside of the centrifugal dust removal section, said crevice can be covered with dust, such as a pebble, and the allophone generated while a pebble etc. circles can be made to control in invention given in any 1 term of above-mentioned claims 1-15.

[0077] According to invention of this invention according to claim 17, it is what prepared smaller than the bore by the side of the centrifugal dust removal section and the intake path section open for free passage the bore by the side of the intake path section which is open for free passage with suction opening of a mouthpiece object in invention given in any 1 term of above-mentioned claims 1-16, and large dust can be prevented from entering in a tail pipe, and can prevent dust **** of intake path circles.

[0078] According to invention of this invention according to claim 18, it is what prepared heights in the bore by the side of the intake path section which is open for free passage with suction opening of a mouthpiece object in invention given in any 1 term of above-mentioned claims 1-17, and small dust passes through intake path circles, and large dust ceases to enter into intake path circles, and can prevent dust **** of intake path circles.

[0079] According to invention of this invention according to claim 19, in invention of the claim 18 above-mentioned publication, heights are ribs, and a lobe can be easily formed by low cost.

[0080] According to invention of this invention according to claim 20, the air induction pipe of a mouthpiece object is constituted in invention given in any 1 term of above-mentioned claims 1-19,

enabling free rotation, and the body of a cleaner is what was considered as the configuration which can be located in an abbreviation perpendicular direction to a up cleaned field. Big dust collects on the pars basilaris ossis occipitalis of the dust collection section with gravity, and by the dust collection section upper part by the side of an electric blower being covered, small dust can distribute dust and can obtain the high dust collection engine performance over a long period of time.

[Translation done.]

* NOTICES *

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

EXAMPLE

[Example] Hereafter, the example of this invention is explained using a drawing.

[0031] (Example 1) Drawing 1 is the side-face sectional view of the vacuum cleaner of the 1st example of this invention, and drawing 2 is the A-A sectional view of drawing 1. Drawing 3 is the Fig. of operation made to rotate the centrifugal dust removal section of this vacuum cleaner. Drawing 4 is the sectional view which prepared the notching section in the case object of this vacuum cleaner.

[0032] The body 10 of a cleaner contains the electric blower 11 which generates a suction force, and cord reel equipment 12 is contained by the periphery of an electric blower 11. The handle section 13 is formed in the upper part of the body 10 of a cleaner, and it can move with the body 10 of a cleaner from supporting this handle section 13. The centrifugal dust removal section 14 possesses ahead of the body 10 of a cleaner, and the mouthpiece object 16 equipped with the absorption opening 15 ahead of the centrifugal dust removal section 14 is established. The mouthpiece object 16 is connected with the end connection 17 prepared ahead of the centrifugal dust removal section 14 free [attachment and detachment], and the end connection 17 is formed in an approximately cylindrical major diameter 18 and an approximately cylindrical narrow diameter portion 19, and constituted double tubing.

[0033] The dust box 21 formed in the shape of [which the centrifugal dust removal section 14 collects dust for the dust from the mouthpiece object 16, and formed the inlet 20] a cup, To the periphery side of the dust box 21 which filters 22 which prevent invasion of dust were consisted of, and was formed in the shape of a cup The case object 25 for forming maintenance and the flueway section 24 of a tail pipe (equivalent to the intake path section) 23 is arranged, and the case object 25 consists of two components on either side, and is stopped by the dust box 21, the screw, pawl fitting, etc. (not shown). The dust which flowed into the dust box 21 from the tail pipe 23 flows with the revolution style which meets the inner skin of a dust box 21, and dust has stopped being able to adhere to a filter 22 side easily. Although dust tends to collect on the inner skin lower part of a dust box 21 when the centrifugal dust removal section 14 is carried out especially every width, the dust which is that a revolution style occurs with suction actuation and which had collected the grade is also stirred, and absorption performance degradation can be controlled.

[0034] Moreover, the tail pipe 23 is arranged in the top-face cross direction center section of the dust box 21. The air inhaled from the suction opening 15 of the mouthpiece object 16 It passes along the narrow diameter portion 19 of an end connection 17, and the tail pipe 23 opened for free passage, and dust is collected to a dust box 21. Further the exhaust air wind from an electric blower 11 It passes along the electric-blower 11 bottom, and the flueway section 24 formed with the case object 24 in the inferior-surface-of-tongue cross direction center section of the dust box 21 is opened for free passage, and again, it is returned to the mouthpiece object 16 through between the major diameter 18 of an end connection 17, and narrow diameter portions 19, and is.

[0035] The operation by the above-mentioned configuration is as follows. Since miniaturization can be attained in a small tooth space and an inlet 20 is in the dust box 21 bottom further from forming a tail pipe 23 in the abbreviation top-face cross direction center section of the dust box 21 formed approximately cylindrical, and locating the flueway section 24 in the abbreviation inferior-surface-of-

tongue cross direction center section of the dust box 21, dust moves to the inferior surface of tongue of a dust box 21 by self-weight, and dust **** in an inlet 20 is prevented.

[0036] next, drawing 2 and drawing 3 -- being, the body 10 of a cleaner and the centrifugal dust removal section 14 have the composition of having separated, and the convex rib 27 prepared in the case object 24 of the centrifugal dust removal section 14 enters into the concave invitation section 26 in which the body 10 of a cleaner was formed caudad, and the centrifugal dust removal section 14 stops the centrifugal dust removal section 14, and consists of buckles 28 prepared above the body 10 of a cleaner free [attachment and detachment]. Moreover, the case object 25 by which method formation of a wrap was carried out in the tail pipe 23 arranged in the abbreviation top-face cross direction center section of the dust box 21 is used as a handle 29, and it is constituted so that the centrifugal dust removal section 14 can be carried. Improvement in workability can be aimed at from being able to use the lug of the case object 25 effectively and carrying the centrifugal dust removal section 14 by the ability of a tail pipe 23 being used for the handle 29 which carries the centrifugal dust removal section 14 for the wrap case object 25.

[0037] Moreover, in drawing 4 , the notching section 30 is formed in the case object 25 which was arranged in the abbreviation top-face cross direction center section of the dust box 21 and by which method formation of a wrap was carried out in the tail pipe 23, and the tail pipe 23 exposed from this notching section 30 is used as a handle 29, and it is constituted so that the centrifugal dust removal section 14 can be carried. Since the tail pipe 23 which forms the notching section 30 in the wrap case object 25, and projects a tail pipe 23 from this notching section 30 can be used for the handle 29 which carries the centrifugal dust removal section 14, miniaturization can be attained further and lightweightization can be raised.

[0038] (Example 2) Next, the 2nd example of this invention is explained using drawing 5 - drawing 9 .

[0039] Drawing 5 is the side-face sectional view of the vacuum cleaner in which the 2nd example of this invention is shown, and drawing 6 is the B-B sectional view of drawing 5 . Drawing 7 is the partial enlarged drawing of the vacuum cleaner in which the 2nd example is shown, and drawing 8 is the partial enlarged drawing showing rotation actuation of the check valve of the vacuum cleaner in which the 2nd example is shown. Drawing 9 is the partial enlarged drawing showing rotation actuation of the check valve in which the wing of the vacuum cleaner in which the 2nd example is shown was arranged. In addition, the same sign is attached about the same component part as the 1st example of the above, and the explanation is omitted.

[0040] It consists of a dust box 21 formed in the shape of [which formed the inlet 20] a cup, and a filter 22 which prevents invasion of dust, and the tail pipe 23 is arranged in the abbreviation inferior-surface-of-tongue cross direction center section of the dust box 21 formed in the shape of a cup, and this tail pipe 23 is covered with the components of the case object 25, and is stopped by the dust box 21, the screw, pawl fitting, etc. (not shown). Since the flueway section 24 is formed, the dimension of the height direction of the body 10 of a cleaner can be small used as a compact between the periphery of a tail pipe 23, and the inside of the case object 25, and it raises appearance beauty.

[0041] Moreover, in drawing 5 and drawing 6 , by the inlet connection 35 between the inlet 20 formed in the dust box 21, and the narrow diameter portion 19 of an end connection 17 and the tail pipe 23 opened for free passage, air entry 35a from this inlet connection 35 is countered, the curve configuration 36 is made and the lobe 37 which projects in the down side of ten outside the body of a cleaner is formed [object / 25 / wrap case] in the tail pipe 23. While being able to come the air course area in a tail pipe 23 by the inlet connection 35 between the inlet 20 formed in the dust box 21, and a tail pipe 23 size and reducing air course resistance by it, even if it gets the worst and dust blocked in an inlet connection, since air course area is large, it becomes possible to remove easily by hand.

[0042] In drawing 6 , moreover, between the inlet 20 formed in the dust box 21, and the narrow diameter portion 19 of an end connection 17 and the tail pipe 23 opened for free passage The check valve 31 formed from the spring material is arranged, and it gets down. This check valve 31 Rotation core 31a is prepared in the end of the direction of inner circumference of a dust box 21, and with this rotation core 31a as the starting point, the check valve 31 is formed so that it may open and close in the direction of

inner circumference of a dust box 21, as an arrow head shows. The rate of flow to which air circles in the inner circumference of a dust box 21 is promoted, the centrifugal-force effectiveness can be demonstrated, the dust adhering to a filter etc. can be removed, and the dust collection engine performance can be raised. By the inlet 20 formed in the dust box 21 and the inlet 20 formed in the dust box 21 by the inlet connection 35 between tail pipes 23 being formed by the flat part 38, it becomes possible to consider the inlet 20 formed in the attached components and dust box 21 of check valve 31 grade, and the edge of a tail pipe 23 as a flat-surface design, and a design that a metal mold configuration is easy and cheap can be performed.

[0043] Moreover, in drawing 6 and drawing 7, the check valve 31 formed from the spring material between the inlet 20 formed in the dust box 21, and the narrow diameter portion 19 of an end connection 17 and the tail pipe 23 opened for free passage is arranged, it gets down, and this check valve 31 is stopped by press fit fitting with the inlet 20 of a dust box 21, and the tail pipe 23. Even if it moves the body 10 of a cleaner in all the directions, dust **** in a tail pipe 23 and the dust bank can be made to prevent.

[0044] In drawing 7, the check valve 31 formed from the spring material which prevents ***** of the dust by which fitting was carried out to the inside of a narrow diameter portion 19 between the suction opening 15 of the mouthpiece object 16, and the narrow diameter portion 19 of an end connection 17 and the tail pipe 23 opened for free passage is arranged. Even if it moves the body 10 of a cleaner in all the directions, dust ***** from the suction opening 15 of the mouthpiece object 16 is prevented. Moreover, since the antistatic agent is contained into the ingredient of dust box 21 grade, the dust adhesion by static electricity and electrification by friction to which air circles in the inner circumference of the centrifugal dust removal section 14 is made to prevent with the components which constitute the centrifugal dust removal section 14. Furthermore, with the components which constitute the centrifugal dust removal section 14, since the ingredient of dust box 21 grade is constituted in transparency, with the components which constitute the centrifugal dust removal section 14, the amount of the dust absorbed in the centrifugal dust removal section 14 is known, and user-friendliness improves from making it dust box 21 grade and transparency. Moreover, since the flat part 38 is formed under the body 10 of a cleaner, if an electric blower 11 stops by the inside of the approximately cylindrical dust box 21, dust will be accumulated in the flat part 38 in which the dust box 21 prepared dust caudad within the centrifugal dust removal section 14 with gravity at homogeneity, and this flat part 38 can be made to collect dust, and the activity which removes dust can be performed easily.

[0045] In drawing 8, moreover, between the inlet 20 formed in the dust box 21, and the narrow diameter portion 19 of an end connection 17 and the tail pipe 23 opened for free passage The check valve 31 formed from the spring material is arranged, and it gets down. This check valve 31 Rotation core 31a is prepared in the end of a perpendicular direction to the direction of inner circumference of a dust box 21, and with this rotation core 31a as the starting point, the check valve 31 is formed so that it may open and close in the perpendicular direction to the direction of dust box 21 inner circumference, as an arrow head shows. Although the dust collection volume in a dust box 21 is usually equivalent to L to the edge of an inlet 20, it can lengthen the part of closing motion, and L1 and distance in the perpendicular direction to the direction of inner circumference of a dust box 21, can enlarge the dust collection volume, and raises the engine performance.

[0046] In drawing 9, next, between the inlet 20 formed in the dust box 21, and the narrow diameter portion 19 of an end connection 17 and the tail pipe 23 opened for free passage A check valve 31 is arranged, it gets down, and two or more wings 33 formed in the cylinder-like pivot 32 from the spring material possess the configuration of this check valve 31, and the both ends of the cylinder-like pivot 32 are supported by the wall 34 formed from the dust box 21, and are constituted free [rotation]. A wing 33 rotates with the suction force of an electric blower 11, and rotation of a check valve 31 is attained, and it is further arranged in the location which contacts the filter 22 in the centrifugal dust removal section 14 in the tip of this wing 33. While the wing 33 of a check valve 31 rotates with the suction force of an electric blower 11, a filter 22 can be struck, the dust adhering to a filter 22 can be removed, and clogging of a filter 22 can be prevented, and the dust collection engine performance can be raised.

[0047] (Example 3) Next, the 3rd example of this invention is explained using drawing 10 .

[0048] Drawing 10 is the sectional view of the vacuum cleaner in which the 3rd example of this invention is shown. In addition, since the thing of the same sign as said example has the same structure, explanation is omitted.

[0049] In the lower part of the dust box 21 formed approximately cylindrical, the dust uptake room 40 where the crevice 39 was formed in the inside is formed.

[0050] The operation by the above-mentioned configuration is as follows.

[0051] When air circles in the inner circumference of a dust box 21, the dust uptake room 40 is covered with heavy dust, such as a pebble, and small dust circles in the inner circumference of a dust box 21. The allophone generated by this while a pebble etc. circles is made to control, and it is made to prevent with [in a dust box 21] a blemish.

[0052] (Example 4) Next, the 4th example of this invention is explained using drawing 11 .

[0053] Drawing 11 is the partial enlarged drawing of the vacuum cleaner in which the 4th example of this invention is shown. In addition, since the thing of the same sign as said example has the same structure, explanation is omitted.

[0054] It is prepared smaller than the bore by the side of the tail pipe 23 which opens the inlet 20 formed in the dust box 21, the narrow diameter portion 19 of an end connection 17, and the bore by the side of the tail pipe 23 which is open for free passage with the narrow diameter portion 19 of an end connection 17 at the tail pipe 23 opened for free passage for free passage with the inlet 20 formed in the dust box 21, and since large dust stops being able to enter easily in a tail pipe 23, it can prevent dust **** in a tail pipe 23.

[0055] Moreover, with the inlet 20 formed in the dust box 21, the narrow diameter portion 19 of an end connection 17, and the tail pipe 23 opened for free passage, the convex rib 41 which is a lobe is formed in the narrow diameter portion 19 of an end connection 17, and the bore by the side of the tail pipe 23 open for free passage, small dust passes through the inside of a tail pipe 23, and large dust ceases to enter in a tail pipe 23, and can prevent dust **** in a tail pipe 23.

[0056] (Example 5) Next, the 5th example of this invention is explained using drawing 12 .

[0057] Drawing 12 is the side-face sectional view which used as the vertical mold the body of a cleaner in which the 6th example of this invention is shown. Since the thing of the same sign as said example has the same structure, explanation is omitted.

[0058] The suction opening 15 of the mouthpiece object 16 and the air induction pipe 42 which was open for free passage are constituted enabling the free mouthpiece object 16 and rotation, and it is constituted so that the body 10 of a cleaner can use it, making it located in the abbreviation perpendicular direction of a up cleaned field.

[0059] The operation by the above-mentioned configuration is as follows.

[0060] When the body 10 of a cleaner is stood almost perpendicularly to a up cleaned field, the centrifugal dust removal section 14 is located under the electric blower 11, big dust collects on the pars basilaris ossis occipitalis of a dust box 21 with gravity, small dust is attracted by the electric-blower 11 side in the upper part of a dust box 21, and only very detailed dust adheres to a filter 22. That is, it becomes possible to separate into size, dust plugging of the dust cannot be carried out, and the high dust collection engine performance can be obtained over a long period of time.

[Translation done.]

* NOTICES *

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The vacuum cleaner which prepared said flueway section in the abbreviation lower part of said centrifugal-dust-removal section while having the absorption path section which opens for free passage the centrifugal-dust-removal section, the body of a cleaner which installs an electric blower inside, the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, and said centrifugal dust removal section and said suction opening, and the flueway section which makes the exhaust-air wind of said electric blower flow back to said suction opening side and preparing the aforementioned absorption path section in the abbreviation upper part of said centrifugal-dust-removal section.

[Claim 2] The vacuum cleaner according to claim 1 which was equipped with the wrap case object for the intake path section, and used said case object as the handle which carries the centrifugal dust removal section.

[Claim 3] Electric cleaning according to claim 1 which used a part of intake path section [at least] as the handle which carries the centrifugal dust removal section.

[Claim 4] The centrifugal dust removal section, the body of a cleaner which installed the electric blower inside, and the mouthpiece object equipped with suction opening for absorbing the dust of a up cleaned field, While having the intake path section which opens said centrifugal dust removal section and said suction opening for free passage, and the flueway section which makes the exhaust air wind of said electric blower flow back to said suction opening side and preparing the aforementioned intake path section in the abbreviation lower part of said centrifugal dust removal section The vacuum cleaner which was equipped with the wrap case object for the aforementioned intake path section, and made the flueway section between said case object and the aforementioned intake path sections.

[Claim 5] A vacuum cleaner given in any 1 term of claims 1-4 which prepared suction opening of a mouthpiece object, and the check valve formed in the connection with the intake path section from the spring material.

[Claim 6] It is a vacuum cleaner to any 1 term of claims 1-5 which prepared the check valve formed in the inlet connection of the centrifugal dust removal section and the intake path section from the spring material.

[Claim 7] A check valve is the vacuum cleaner according to claim 6 which set the direction of inner circumference of the centrifugal dust removal section as the rotation core.

[Claim 8] A check valve is the vacuum cleaner according to claim 6 which set the perpendicular direction as the rotation core to the direction of inner circumference of the centrifugal dust removal section.

[Claim 9] A vacuum cleaner given in any 1 term of claims 1-5 which prepared a check valve which contacts the filter of said centrifugal dust removal circles in said blade tip while being able to rotate to the inlet connection of the centrifugal dust removal section and the intake path section freely, being formed in it from the spring material and having two or more wings.

[Claim 10] A vacuum cleaner given in any 1 term of claims 1-9 which constituted the curve

configuration in which a case object has a lobe.

[Claim 11] The vacuum cleaner according to claim 10 with which the lobe of a case object is located in the abbreviation lower part of the body of a cleaner.

[Claim 12] A vacuum cleaner given in any 1 term of claims 1-11 which formed the centrifugal dust removal section with the ingredient containing an antistatic agent.

[Claim 13] A vacuum cleaner given in any 1 term of claims 1-12 which formed a case object and/or the centrifugal dust removal section by the transference member.

[Claim 14] A vacuum cleaner given in any 1 term of claims 1-13 which prepared the flat part in the inside lower part of the centrifugal dust removal section.

[Claim 15] The vacuum cleaner according to claim 14 which prepared the inlet connection of said centrifugal dust removal section and the intake path section in the flat part of the inside lower part of the centrifugal dust removal section.

[Claim 16] A vacuum cleaner given in any 1 term of claims 1-15 which established the crevice in the inside of the centrifugal dust removal section.

[Claim 17] A vacuum cleaner given in any 1 term of claims 1-16 which made suction opening of a mouthpiece object, and the bore by the side of the intake path section open for free passage smaller than the bore by the side of the centrifugal dust removal section and the intake path section open for free passage.

[Claim 18] A vacuum cleaner given in any 1 term of claims 1-17 which prepared heights in suction opening of a mouthpiece object, and the bore by the side of the intake path section open for free passage.

[Claim 19] The vacuum cleaner according to claim 18 whose heights are ribs.

[Claim 20] A vacuum cleaner given in any 1 term of claims 1-19 which constituted for the air induction pipe of a mouthpiece object, enabling free rotation, and the body of a cleaner considered as the configuration which can be located in an abbreviation perpendicular direction to a up cleaned field.

[Translation done.]

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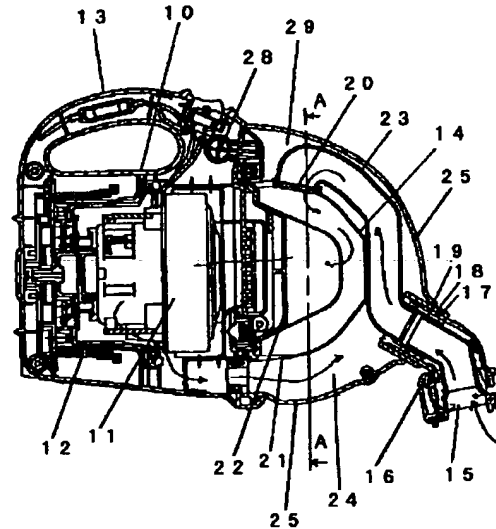
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(54)【発明の名称】 電気掃除機

(57)【要約】

【課題】 本発明は、吸引力の低下による集塵性能の低下を防止する電気掃除機を提供することを目的としている。

【解決手段】 遠心力集塵部14と電動送風機11を内設する掃除機本体10と、被掃除面の塵埃を吸込むための吸い込み口15を備えた吸口体16と、前記遠心力集塵部14と前記吸い込み口15とを連通する吸込み管23と、前記電動送風機11の排気風を前記吸い込み口15側に還流させる排気通路部24を備えたもので、遠心力集塵部14により集塵性能の低下を防止し、また、吸込み管23を前記遠心力集塵部14の略上方に設けるとともに、前記排気通路部24を前記遠心力集塵部14の略下方に設けたことにより、排気通路部24の熱が吸込み管23の吸気に伝わりにくく、電動送風機11の温度上昇を抑えることができる。



10 掃除機本体	22 フィルター
11 電動送風機	23 吸込み管
14 遠心力集塵部	24 排気通路部
15 吸い込み口	25 ケース体
16 吸口体	29 把手

【特許請求の範囲】

【請求項1】 遠心力集塵部と電動送風機を内設する掃除機本体と、被掃除面の塵埃を吸込むための吸い込み口を備えた吸口体と、前記遠心力集塵部と前記吸い込み口とを連通する吸込通路部と、前記電動送風機の排気風を前記吸い込み口側に還流させる排気通路部を備え、前記吸込通路部を前記遠心力集塵部の略上方に設けるとともに、前記排気通路部を前記遠心力集塵部の略下方に設けた電気掃除機。

【請求項2】 吸込通路部を覆うケース体を備え、前記ケース体を遠心力集塵部を持ち運ぶ把手にした請求項1記載の電気掃除機。

【請求項3】 吸込通路部の少なくとも一部を遠心力集塵部を持ち運ぶ把手にした請求項1記載の電気掃除機。

【請求項4】 遠心力集塵部と電動送風機を内設した掃除機本体と、被掃除面の塵埃を吸込むための吸い込み口を備えた吸口体と、前記遠心力集塵部と前記吸い込み口とを連通する吸込通路部と、前記電動送風機の排気風を前記吸い込み口側に還流させる排気通路部を備え、前記吸込通路部を前記遠心力集塵部の略下方に設けるとともに、前記吸込通路部を覆うケース体を備え、前記ケース体と前記吸込通路部との間を排気通路部とした電気掃除機。

【請求項5】 吸口体の吸い込み口と、吸込通路部との接続部に、弾性材料より形成された逆止弁を設けた請求項1～4のいずれか1項に記載の電気掃除機。

【請求項6】 遠心力集塵部と吸込通路部との吸気口接続部に、弾性材料より形成された逆止弁を設けた請求項1～5のいずれか1項に記載の電気掃除機。

【請求項7】 逆止弁は、遠心力集塵部の内周方向を回転中心とした請求項6記載の電気掃除機。

【請求項8】 逆止弁は、遠心力集塵部の内周方向に対し垂直な方向を回転中心とした請求項6記載の電気掃除機。

【請求項9】 遠心力集塵部と吸込通路部との吸気口接続部に、回転自在で弾性材料より形成され複数の羽根を有するとともに、前記羽根の先端を前記遠心力集塵部内のフィルターと当接するような逆止弁を設けた請求項1～5のいずれか1項に記載の電気掃除機。

【請求項10】 ケース体が突出部を有する湾曲形状を成した請求項1～9のいずれか1項に記載の電気掃除機。

【請求項11】 ケース体の突出部が掃除機本体の略下方に位置する請求項10記載の電気掃除機。

【請求項12】 遠心力集塵部を帯電防止剤を含有する材料で形成した請求項1～11のいずれか1項に記載の電気掃除機。

【請求項13】 ケース体および/または遠心力集塵部を透明部材で形成した請求項1～12のいずれか1項に記載の電気掃除機。

【請求項14】 遠心力集塵部の内面下方に平坦部を設けた請求項1～13のいずれか1項に記載の電気掃除機。

【請求項15】 遠心力集塵部の内面下方の平坦部に、前記遠心力集塵部と吸込通路部との吸気口接続部を設けた請求項14記載の電気掃除機。

【請求項16】 遠心力集塵部の内面に凹部を設けた請求項1～15のいずれか1項に記載の電気掃除機。

【請求項17】 吸口体の吸い込み口と連通する吸込通路部側の内径を、遠心力集塵部と連通する吸込通路部側の内径より小さくした請求項1～16のいずれか1項に記載の電気掃除機。

【請求項18】 吸口体の吸い込み口と連通する吸込通路部側の内径に、凸部を設けた請求項1～17のいずれか1項に記載の電気掃除機。

【請求項19】 凸部がリブである請求項18記載の電気掃除機。

【請求項20】 吸口体の吸気パイプを回転自在に構成し、掃除機本体が被掃除面に対し略垂直方向に位置できる構成とした請求項1～19のいずれか1項に記載の電気掃除機。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、一般家庭で使用される電機掃除機に関するもので、特に排気風の少なくとも一部を、掃除機本体外に排出せずに吸口体にもどして循環させるようにした電気掃除機に関するものである。

【0002】

【従来の技術】この種の電気掃除機としては例えば、特開2000-5113に開示されたようなものがあり、図13を用いて説明する。

【0003】集塵室1の後方に電動送風機2、前記電動送風機2の後方に電源コード3を巻き取るコード巻き取り装置4を備え、吸口体5は集塵室1と接続されている。また集塵室1内に集塵袋6が配設されている。

【0004】同図で矢印で示すように、塵埃は、電動送風機1により、吸口体5の吸い込み口7より空気とともに吸引され、吸引された空気は、集塵袋6を透過し、電動送風機2の内部を通過して集塵室1の下部に設けられた排気通路部8を通り、吸口体5へと循環している。

【0005】

【発明が解決しようとする課題】しかしながら上記従来の構成において、吸口体5の吸い込み口7より被掃除面の塵埃を吸引し、集塵袋6にて集塵されながら、電動送風機1の吸引方向に対して前記塵埃は集塵されるため、前記集塵袋6に集塵される塵埃の分布が不均一で吸引力が低下しやすいという問題があった。

【0006】本発明は上記従来の課題を解決するもので、吸引力の低下による集塵性能の低下を防止する電気掃除機を提供することを目的としている。

【0007】

【課題を解決するための手段】上記目的を達成するために本発明は、遠心力集塵部と電動送風機を内設する掃除機本体と、被掃除面の塵埃を吸込むための吸い込み口を備えた吸口体と、前記遠心力集塵部と前記吸い込み口とを連通する吸込通路部と、前記電動送風機の排気風を前記吸い込み口側に還流させる排気通路部を備えたものである。この構成によれば、吸い込んだ塵埃が遠心力集塵部で旋回流と共に旋回するので塵埃の分布が良好で、吸引力が低下するのを防止でき、集塵性能の低下を防止できる。吸引力が低下すると電動送風機の排気風量も低下するが、上述のように吸引力の低下を防止する遠心力集塵部を採用することで、電動送風機の排気風量も確保でき、吸口体の吸込口側に還流させる排気風量の低下による塵埃の吸い込み性能の低下も防止することができる。

【0008】塵埃の吸い込み性能の低下も防止については上記構成で十分であるが、さらに、前記吸込通路部を前記遠心力集塵部の略上方に設けるとともに、前記排気通路部を前記遠心力集塵部の略下方に設けている構成とすることにより、排気通路部の熱影響により吸込通路部を流れる吸気が暖められるのを抑制し、排気を循環させる電気掃除機の温度上昇を抑制できる。

【0009】

【発明の実施の形態】本発明の請求項1記載の発明は、遠心力集塵部と電動送風機を内設する掃除機本体と、被掃除面の塵埃を吸込むための吸い込み口を備えた吸口体と、前記遠心力集塵部と前記吸い込み口とを連通する吸込通路部と、前記電動送風機の排気風を前記吸い込み口側に還流させる排気通路部を備え、前記吸込通路部を前記遠心力集塵部の略上方に設けるとともに、前記排気通路部を前記遠心力集塵部の略下方に設けたものである。この構成によれば、吸い込んだ塵埃が遠心力集塵部で旋回流と共に旋回するので塵埃の分布が良好で、吸引力が低下するのを防止でき、集塵性能の低下を防止できる。吸引力が低下すると電動送風機の排気風量も低下するが、上述のように吸引力の低下を防止する遠心力集塵部を採用することで、電動送風機の排気風量も確保でき、吸口体の吸込口側に還流させる排気風量の低下による塵埃の吸い込み性能の低下も防止することができる。また、前記吸込通路部を前記遠心力集塵部の略上方に設けるとともに、前記排気通路部を前記遠心力集塵部の略下方に設けているので、吸込通路部と排気通路部との配置を上下に分けて行うことで、排気通路部の熱影響により吸込通路部を流れる吸気が暖められるのを抑制し、排気を循環させる電気掃除機の温度上昇を抑制できる。

【0010】本発明の請求項2記載の発明は、上記請求項1記載の発明において、吸込通路部を覆うケース体を備え、前記ケース体を遠心力集塵部を持ち運ぶ把手にしたもので、ケース体が無駄に使用することなく用途を拡大し、使い勝手を向上させる。

【0011】本発明の請求項3記載の発明は、上記請求項1記載の発明において、吸込通路部の少なくとも一部を、前記遠心力集塵部を持ち運ぶ把手にしたもので、さらにコンパクト化が図れ、軽量化を向上させることができる。

【0012】本発明の請求項4記載の発明は、遠心力集塵部と電動送風機を内設した掃除機本体と、被掃除面の塵埃を吸込むための吸い込み口を備えた吸口体と、前記遠心力集塵部と前記吸い込み口とを連通する吸込通路部と、前記電動送風機の排気風を前記吸い込み口側に還流させる排気通路部を備え、前記吸込通路部を前記遠心力集塵部の略下方に設けるとともに、前記吸込通路部を覆うケース体を備え、前記ケース体と前記吸込通路部との間を排気通路部としたもので、掃除機本体の上面寸法を小さくしコンパクト化が図れる。

【0013】本発明の請求項5記載の発明は、上記請求項1～4のいずれか1項に記載の発明において、吸口体の吸い込み口と、吸込通路部との接続部に、弾性材料より形成された逆止弁を設けたもので、吸口体の吸い込み口からのゴミこぼれを防止する。

【0014】本発明の請求項6記載の発明は、上記請求項1～5のいずれか1項に記載の発明において、遠心力集塵部と吸込通路部との吸気口接続部に、弾性材料より形成された逆止弁を設けたもので、吸込通路部内のゴミ詰り、ゴミたまりを防止させる。

【0015】本発明の請求項7記載の発明は、上記請求項6記載の発明において、逆止弁は、遠心力集塵部の内周方向に回転中心を設けたもので、遠心力集塵部の内周を旋回する空気の流れを促進させ、フィルター等に付着する塵埃を取り除き集塵性能を向上させることができる。

【0016】本発明の請求項8記載の発明は、上記請求項6記載の発明において、逆止弁は、遠心力集塵部の内周方向に対し垂直な方向に回転中心を設けたことより、上記請求項7記載の発明で述べた逆止弁構成に比べ、集塵容積を大きくすることができる。

【0017】本発明の請求項9記載の発明は、上記請求項1～5のいずれか1項に記載の発明において、遠心力集塵部と吸込通路部との吸気口接続部に、回転自在で弾性材料より形成され複数の羽根を有するとともに、前記羽根の先端を前記遠心力集塵部内のフィルターと当接するような逆止弁を設けたもので、通常使用状態でフィルターを叩き、フィルターに付着する塵埃を取り除き、且つ、フィルターの目詰りを防止し集塵性能を向上させることができる。

【0018】本発明の請求項10記載の発明は、上記請求項1～9のいずれか1項に記載の発明において、ケース体が突出部を有する湾曲形状を成したもので、吸込通路部内の吸気面積を大きくでき集塵性能を向上させることが可能となる。

【0019】本発明の請求項11記載の発明は、上記請求項10記載の発明において、ケース体の突出部が掃除機本体の略下方に位置するもので、外観美を損なわすことを防止する。

【0020】本発明の請求項12記載の発明は、上記請求項1～11のいずれか1項に記載の発明において、遠心力集塵部を帯電防止剤を含有する部材で形成したもので、空気が遠心力集塵部の内周を旋回する摩擦による静電気でのゴミ付着を防止させる。

【0021】本発明の請求項13記載の発明は、上記請求項1～12のいずれか1項に記載の発明において、ケース体およびまたは遠心力集塵部を透明部材で形成したもので、遠心力集塵部内の吸込んだゴミの量がわかり使い勝手が向上する。

【0022】本発明の請求項14記載の発明は、上記請求項1～13のいずれか1項に記載の発明において、遠心力集塵部の内面下方に平坦部を設けたもので、重力により塵埃は遠心力集塵部内の下方溜り、平坦部により溜まった塵埃を分散させることなく、塵埃を一個所に集約させることができ、塵埃を除去する作業が容易にできる。

【0023】本発明の請求項15記載の発明は、上記請求項14記載の発明において、遠心力集塵部の内面下方の平坦部に、前記遠心力集塵部と吸込通路部との吸気口接続部を設けたもので、吸気口接続部の逆止弁等の付属部品及び吸気口接続部を平面設計とすることができ、金型構成が容易となり単純な形状で構成できる。

【0024】本発明の請求項16記載の発明は、上記請求項1～15のいずれか1項に記載の発明において、遠心力集塵部の内面に凹部を設けたもので、小石等の塵埃は前記凹部に溜り、小石等が旋回中に発生する異音を抑制させることができる。

【0025】本発明の請求項17記載の発明は、上記請求項1～16のいずれか1項に記載の発明において、吸口体の吸い込み口と連通する吸込通路部側の内径を、遠心力集塵部と連通する吸込通路部側の内径より小さく設けたもので、大きい塵埃が吸込通路部内に入り込まないようにすることができ、吸込通路部内のゴミ詰りを防止することができる。

【0026】本発明の請求項18記載の発明は、上記請求項1～17のいずれか1項に記載の発明において、吸口体の吸い込み口と連通する吸込通路部側の内径に、凸部を設けたもので、小さな塵埃は吸込通路部内を通り抜け、大きい塵埃は吸込通路部内に入り込まないようになり、吸込通路部内のゴミ詰りを防止することができる。

【0027】本発明の請求項19記載の発明は、上記請求項18記載の発明において、凸部がリブであるもので、低コストで容易に突出部が形成できる。

【0028】本発明の請求項20記載の発明は、上記請求項1～19のいずれか1項に記載の発明において、吸

口体の吸気パイプを回動自在に構成し、掃除機本体が被掃除面に対し略垂直方向に位置できる構成としたもので、大きな塵埃は重力により集塵部の底部に溜まり、小さな塵埃は電動送風機側の集塵部上部に溜ることで、塵埃を分散させることができ、長期にわたって高い集塵性能を得ることができる。

【0029】なお、本発明の基本構成は、課題を解決するための手段で述べた「遠心力集塵部と電動送風機を内設する掃除機本体と、被掃除面の塵埃を吸込むための吸い込み口を備えた吸口体と、前記遠心力集塵部と前記吸い込み口とを連通する吸込通路部と、前記電動送風機の排気風を前記吸い込み口側に還流させる排気通路部を備えた電気掃除機」であることからして、この基本構成に上記請求項1～20の構成を適宜組み合わせることもできる。

【0030】

【実施例】以下、本発明の実施例について、図面を用いて説明する。

【0031】(実施例1) 図1は、本発明の第1の実施例の電気掃除機の側面断面図であり、図2は、図1のA-A断面図である。図3は、同電気掃除機の遠心力集塵部を回動させた動作図である。図4は、同電気掃除機のケース体に切り欠き部を設けた断面図である。

【0032】掃除機本体10は、吸引力を発生する電動送風機11を内蔵し、電動送風機11の外周には、コードリール装置12が収納されている。掃除機本体10の上部には、取っ手部13が形成されており、この取っ手部13を握持することにより掃除機本体10を持ち動かすことができる。掃除機本体10の前方には、遠心力集塵部14が具備されており、遠心力集塵部14の前方には、吸い込み口15を備えた吸口体16が設けられている。吸口体16は、遠心力集塵部14の前方に設けられた接続口17と着脱自在に接続されており、接続口17は略円筒状の大径部18と小径部19と構成された2重管に形成されている。

【0033】遠心力集塵部14は、吸口体16からの塵埃を集塵するもので、吸気口20を設けたカップ状に形成したダストボックス21と、塵埃の侵入を防止するフィルター22とで構成され、カップ状に形成したダストボックス21の外周側には、吸込み管(吸込通路部に相当)23の保持及び排気通路部24を形成する為のケース体25が配設されており、ケース体25は左右の2部品からなり、ダストボックス21とビス及び爪嵌合等(図示せず)で係止されている。吸込み管23からダストボックス21に流れ込んだ塵埃は、ダストボックス21の内周面に沿う旋回流とともに流れ、塵埃がフィルター22側に付着しにくくなっている。特に、遠心力集塵部14が横置きされる場合には、塵埃がダストボックス21の内周面下方に溜まりやすいが、吸引動作と共に旋回流が発生することである程度溜まっていた塵埃もかき

回されて、吸い込み性能の低下を抑制できる。

【0034】また、吸込み管23は、ダストボックス21の上面幅方向中央部に配置されている。吸気口16の吸い込み口15から吸われた空気は、接続口17の小径部19と連通された吸込み管23を通り、ダストボックス21に集塵され、さらに、電動送風機11からの排気風は、電動送風機11の下側を通り、ダストボックス21の下面幅方向中央部で、ケース体24で形成された排気通路部24を連通し、再び、接続口17の大径部18と小径部19との間を通り吸気口16へ戻される。

【0035】上記構成による作用は以下の通りである。吸込み管23を、略円筒状に形成したダストボックス21の略上面幅方向中央部に設け、また、排気通路部24をダストボックス21の略下面幅方向中央部に位置させることより小スペースでコンパクト化が図れ、さらに吸気口20がダストボックス21の上側にある為、自重で塵埃はダストボックス21の下面に移動し、吸気口20内のゴミ詰りを防止する。

【0036】次に図2、図3において、掃除機本体10と、遠心力集塵部14は別れた構成となっており、遠心力集塵部14は掃除機本体10の下方に設けられた凹状の誘い部26に、遠心力集塵部14のケース体24に設けられた凸リブ27が入り込み、掃除機本体10の上方に設けられた尾錠28で遠心力集塵部14を係止させ着脱自在に構成されている。また、ダストボックス21の略上面幅方向中央部に配設された吸込み管23を覆うよう形成されたケース体25を把手29とし、遠心力集塵部14を持ち運べるように構成されている。吸込み管23を覆うケース体25を遠心力集塵部14を持ち運ぶ把手29に利用でき、かつ、遠心力集塵部14を持ち運ぶことにより作業性の向上を図ることができる。

【0037】また、図4において、ダストボックス21の略上面幅方向中央部に配設された、吸込み管23を覆うよう形成されたケース体25に切り欠き部30を設け、この切り欠き部30から露出する吸込み管23を把手29とし、遠心力集塵部14を持ち運べるように構成されている。吸込み管23を覆うケース体25に切り欠き部30を形成し、この切り欠き部30から突出する吸込み管23を遠心力集塵部14を持ち運ぶ把手29に利用できるため、さらにコンパクト化が図れ、軽量化を向上させることが出来る。

【0038】(実施例2) 次に、本発明の第2の実施例を図5～図9を用いて説明する。

【0039】図5は本発明の第2の実施例を示す電気掃除機の側面断面図であり、図6は図5のB-B断面図である。図7は第2の実施例を示す電気掃除機の部分拡大図で、図8は第2の実施例を示す電気掃除機の逆止弁の回動動作を示す部分拡大図である。図9は第2の実施例を示す電気掃除機の羽根が配設された逆止弁の回動動作

を示す部分拡大図である。なお上記第1の実施例と同一構成部品については同一符号を付して、その説明を省略する。

【0040】吸気口20を設けたカップ状に形成したダストボックス21と、塵埃の侵入を防止するフィルター22とで構成され、カップ状に形成したダストボックス21の略下面幅方向中央部には、吸込み管23が配設されており、この吸込み管23は、ケース体25の部品にて覆われ、ダストボックス21とビス及び、爪嵌合等(図示せず)で係止されている。吸込み管23の外周と、ケース体25の内面との間は、排気通路部24が形成されているため、掃除機本体10の高さ方向の寸法を小さくコンパクトにすることができ、外観美を向上させる。

【0041】また、図5、図6において、ダストボックス21に形成された吸気口20と、接続口17の小径部19と連通された吸込み管23との間の吸気口接続部35で、この吸気口接続部35からの空気入り口35aに対向し、吸込み管23を覆うケース体25を湾曲形状36をなして、掃除機本体外10の下方向側に突出する突出部37が設けられている。ダストボックス21に形成された吸気口20と、吸込み管23との間の吸気口接続部35で、吸込み管23内の風路面積を大きくとれ、風路抵抗を減らすとともに、吸気口接続部に最悪、ゴミが詰っても風路面積が大きい為、手で容易に除去することが可能となる。

【0042】また、図6において、ダストボックス21に形成された吸気口20と、接続口17の小径部19と連通された吸込み管23との間に、弾性材料より形成された逆止弁31が配設されおり、この逆止弁31は、ダストボックス21の内周方向の一端に回動中心31aが設けられており、この回動中心31aを起点に逆止弁31は、矢印で示すようダストボックス21の内周方向に開閉するよう形成されている。空気がダストボックス21の内周を旋回する流速を促進させ遠心力効果が発揮され、フィルター等に付着する塵埃を取り除き集塵性能を向上させることができる。ダストボックス21に形成された吸気口20と、吸込み管23との間の吸気口接続部35で、ダストボックス21に形成された吸気口20を平坦部38に設けられていることで、逆止弁31等の付属部品及び、ダストボックス21に形成された吸気口20、吸込み管23の端部を平面設計とすることが可能となり、金型構成が容易で廉価な設計ができる。

【0043】また、図6、図7において、ダストボックス21に形成された吸気口20と、接続口17の小径部19と連通された吸込み管23との間に、弾性材料より形成された逆止弁31が配設されおり、この逆止弁31は、ダストボックス21の吸気口20と、吸込み管23とで圧入嵌合で係止されている。掃除機本体10をあらゆる方向に移動させても吸込み管23内のゴミ詰り、ゴ

ミたまりを防止させることができる。

【0044】図7において、吸口体16の吸い込み口15と、接続口17の小径部19と連通された吸込み管23との間で、小径部19の内面に嵌合された塵埃のこぼれを防止する弾性材料より形成された逆止弁31が配設されている。掃除機本体10をあらゆる方向に移動させても吸口体16の吸い込み口15からのゴミこぼれを防止する。また、遠心力集塵部14を構成する部品で、ダストボックス21等の材料に帯電防止剤を含有しているため、空気が遠心力集塵部14の内周を旋回する摩擦による静電気及び、帯電でのゴミ付着を防止させる。さらに、遠心力集塵部14を構成する部品で、ダストボックス21等の材料を透明に構成しているため、遠心力集塵部14を構成する部品で、ダストボックス21等と透明にすることより、遠心力集塵部14内の吸込んだゴミの量がわかり使い勝手が向上する。また、略円筒状のダストボックス21の内面で、掃除機本体10の下方に平坦部38が設けられているため、電動送風機11が停止すれば、重力により塵埃は遠心力集塵部14内でダストボックス21の下方に設けた平坦部38に均一に塵埃が蓄積され、かつ、この平坦部38に、塵埃を集約させることができ、塵埃を除去する作業が容易にできる。

【0045】また、図8において、ダストボックス21に形成された吸気口20と、接続口17の小径部19と連通された吸込み管23との間に、弾性材料より形成された逆止弁31が配設されおり、この逆止弁31は、ダストボックス21の内周方向に対して垂直な方向の一端に回転中心31aが設けられており、この回転中心31aを起点に逆止弁31は、矢印で示すようダストボックス21内周方向に対して垂直な方向に開閉するよう形成されている。ダストボックス21内の集塵容積は、通常吸気口20の端部までのLに相当するが、ダストボックス21の内周方向に対して垂直な方向に開閉の分、L1と距離をのばせ集塵容積を大きくすることができ、性能を向上させる。

【0046】次に、図9において、ダストボックス21に形成された吸気口20と、接続口17の小径部19と連通された吸込み管23との間に、逆止弁31が配設されおり、この逆止弁31の形状は、円筒状の支軸32に弾性材料より形成された複数の羽根33が具備されており、円筒状の支軸32の両端は、ダストボックス21から形成された、壁34に支持され回転自在に構成されている。逆止弁31は、電動送風機11の吸引力により羽根33が回転し回転自在となり、さらに、この羽根33の先端を、遠心力集塵部14内のフィルター22と当接する位置に配設されている。電動送風機11の吸引力により逆止弁31の羽根33が回転しながらフィルター22を叩き、フィルター22に付着する塵埃を取り除き、且つ、フィルター22の目詰りを防止し集塵性能を向上させることができる。

【0047】(実施例3)次に、本発明の第3の実施例を図10を用いて説明する。

【0048】図10は本発明の第3の実施例を示す電気掃除機の断面図である。なお、前記実施例と同一符号のものは、同一構造を有するため説明は省略する。

【0049】略円筒状に形成したダストボックス21の下方で、内面に凹部39が形成された塵埃捕集室40が設けられている。

【0050】上記構成による作用は以下の通りである。

【0051】空気が、ダストボックス21の内周を旋回することにより、小石等の重い塵埃は塵埃捕集室40に溜り、小さい塵埃は、ダストボックス21の内周を旋回する。このことにより小石等が旋回中に発生する異音を抑制させ、ダストボックス21内の傷付きを防止させる。

【0052】(実施例4)次に、本発明の第4の実施例を図11を用いて説明する。

【0053】図11は本発明の第4の実施例を示す電気掃除機の部分拡大図である。なお、前記実施例と同一符号のものは、同一構造を有するため説明は省略する。

【0054】ダストボックス21に形成された吸気口20と、接続口17の小径部19と連通された吸込み管23で、接続口17の小径部19と連通する吸込み管23側の内径を、ダストボックス21に形成された吸気口20と連通する吸込み管23側の内径より小さく設けられていて、大きい塵埃は、吸込み管23内に入り込みにくくなる為、吸込み管23内のゴミ詰りを防止することができる。

【0055】また、ダストボックス21に形成された吸気口20と、接続口17の小径部19と連通された吸込み管23で、接続口17の小径部19と連通する吸込み管23側の内径に突出部である凸状のリブ41が設けられていて、小さな塵埃は、吸込み管23内を通り抜け、大きい塵埃は、吸込み管23内に入り込まないようになり、吸込み管23内のゴミ詰りを防止することができる。

【0056】(実施例5)次に、本発明の第5の実施例を図12を用いて説明する。

【0057】図12は本発明の第6の実施例を示す掃除機本体を縦型にした側面断面図である。前記実施例と同一符号のものは、同一構造を有するため説明は省略する。

【0058】吸口体16の吸い込み口15と連通した吸気パイプ42を吸口体16と回転自在に構成され、掃除機本体10が被掃除面の略垂直方向に位置させて使用できるように構成されている。

【0059】上記構成による作用は以下の通りである。

【0060】掃除機本体10を被掃除面に対しほぼ垂直に立てた時、電動送風機11の下方に遠心力集塵部14が位置し、重力により大きな塵埃はダストボックス21

の底部に溜まり、小さな塵埃は、電動送風機11側でダストボックス21の上部に吸引され、フィルター22には極めて微細な塵埃だけが付着する。すなわち、塵埃を大小に分離することが可能となりゴミ詰まりすることがなく、長期にわたって高い集塵性能を得ることができる。

【0061】

【発明の効果】本発明の請求項1記載の発明によれば、遠心力集塵部と電動送風機を内設する掃除機本体と、被掃除面の塵埃を吸込むための吸い込み口を備えた吸口体と、前記遠心力集塵部と前記吸い込み口とを連通する吸込通路部と、前記電動送風機の排気風を前記吸い込み口側に還流させる排気通路部を備え、前記吸込通路部を前記遠心力集塵部の略上方に設けるとともに、前記排気通路部を前記遠心力集塵部の略下方に設けたもので、吸引力の低下による集塵性能の低下を防止する電気掃除機を提供できる。

【0062】本発明の請求項2記載の発明によれば、上記請求項1記載の発明において、吸込通路部を覆うケース体を備え、前記ケース体を遠心力集塵部を持ち運ぶ把手にしたもので、ケース体を無駄に使用することなく用途を拡大し、使い勝手を向上させる。

【0063】本発明の請求項3記載の発明によれば、上記請求項1記載の発明において、吸込通路部の少なくとも一部を前記遠心力集塵部を持ち運ぶ把手にしたもので、さらにコンパクト化が図れ、軽量化を向上させることが出来る。

【0064】本発明の請求項4記載の発明によれば、遠心力集塵部と電動送風機を内設した掃除機本体と、被掃除面の塵埃を吸込むための吸い込み口を備えた吸口体と、前記遠心力集塵部と前記吸い込み口とを連通する吸込通路部と、前記電動送風機の排気風を前記吸い込み口側に還流させる排気通路部を備え、前記吸込通路部を前記遠心力集塵部の略下方に設けるとともに、前記吸込通路部を覆うケース体を備え、前記ケース体と前記吸込通路部との間を排気通路部としたもので、掃除機本体の上面寸法を小さくしコンパクト化が図れる。

【0065】本発明の請求項5記載の発明によれば、上記請求項1～4のいずれか1項に記載の発明において、吸口体の吸い込み口と、吸込通路部との接続部に、弾性材料より形成された逆止弁を設けたもので、吸口体の吸い込み口からのゴミこぼれを防止する。

【0066】本発明の請求項6記載の発明によれば、上記請求項1～5のいずれか1項に記載の発明において、遠心力集塵部と吸込通路部との吸気口接続部に、弾性材料より形成された逆止弁を設けたもので、吸込通路部内のゴミ詰り、ゴミたまりを防止させる。

【0067】本発明の請求項7記載の発明によれば、上記請求項6記載の発明において、逆止弁は、遠心力集塵部の内周方向に回転中心を設けたもので、遠心力集塵部

の内周を回転する空気の流れを促進させ、フィルター等に付着する塵埃を取り除き集塵性能を向上させることができる。

【0068】本発明の請求項8記載の発明によれば、上記請求項6記載の発明において、逆止弁は、遠心力集塵部の内周方向に対し垂直な方向に回転中心を設けたことより、上記請求項7記載の発明で述べた逆止弁構成に比べ、集塵容積を大きくすることができる。

【0069】本発明の請求項9記載の発明によれば、上記請求項1～5のいずれか1項に記載の発明において、遠心力集塵部と吸込通路部との吸気口接続部に、回転自在で弾性材料より形成され複数の羽根を有するとともに、前記羽根の先端を前記遠心力集塵部内のフィルターと当接するような逆止弁を設けたもので、通常使用状態でフィルターを叩き、フィルターに付着する塵埃を取り除き、且つ、フィルターの目詰りを防止し集塵性能を向上させることができる。

【0070】本発明の請求項10記載の発明によれば、上記請求項1～9のいずれか1項に記載の発明において、ケース体が突出部を有する湾曲形状を成したもので、吸込み管内の吸気面積を大きくでき集塵性能を向上させることが可能となる。

【0071】本発明の請求項11記載の発明によれば、上記請求項10記載の発明において、ケース体の突出部が掃除機本体の略下方に位置するもので、外観美を損なわすことを防止する。

【0072】本発明の請求項12記載の発明によれば、上記請求項1～11のいずれか1項に記載の発明において、遠心力集塵部を帯電防止剤を含有する部材で形成したもので、空気が遠心力集塵部の内周を回転する摩擦による静電気でのゴミ付着を防止させる。

【0073】本発明の請求項13記載の発明によれば、上記請求項1～12のいずれか1項に記載の発明において、ケース体およびまたは遠心力集塵部を透明部材で形成したもので、遠心力集塵部内の吸込んだゴミの量がわかり使い勝手が向上する。

【0074】本発明の請求項14記載の発明によれば、上記請求項1～13のいずれか1項に記載の発明において、遠心力集塵部の内面下方に平坦部を設けたもので、重力により塵埃は遠心力集塵部内の下方溜り、平坦部により溜まった塵埃を分散させることなく、塵埃を一個所に集約させることができ、塵埃を除去する作業が容易にできる。

【0075】本発明の請求項15記載の発明によれば、上記請求項14記載の発明において、遠心力集塵部の内面下方に平坦部に、前記遠心力集塵部と吸込通路部との吸気口接続部を設けたもので、吸気口接続部の逆止弁等の付属部品及び吸気口接続部を平面設計とすることより金型構成が容易となり単純な形状で構成できる。

【0076】本発明の請求項16記載の発明によれば、

上記請求項1～15のいずれか1項に記載の発明において、遠心力集塵部の内面に凹部を設けたもので、小石等の塵埃は前記凹部に溜り、小石等が旋回中に発生する異音を抑制させることができる。

【0077】本発明の請求項17記載の発明によれば、上記請求項1～16のいずれか1項に記載の発明において、吸口体の吸い込み口と連通する吸込通路部側の内径を、遠心力集塵部と連通する吸込通路部側の内径より小さく設けたもので、大きい塵埃が吸込み管内に入り込まないようにすることができ、吸込通路部内のゴミ詰りを防止することができる。

【0078】本発明の請求項18記載の発明によれば、上記請求項1～17のいずれか1項に記載の発明において、吸口体の吸い込み口と連通する吸込通路部側の内径に、凸部を設けたもので、小さな塵埃は吸込通路部内を通り抜け、大きい塵埃は吸込通路部内に入り込まないようになり、吸込通路部内のゴミ詰りを防止することができる。

【0079】本発明の請求項19記載の発明によれば、上記請求項18記載の発明において凸部がリップであるもので、低コストで容易に突出部が形成できる。

【0080】本発明の請求項20記載の発明によれば、上記請求項1～19のいずれか1項に記載の発明において、吸口体の吸気パイプを回動自在に構成し、掃除機本体が被掃除面に対し略垂直方向に位置できる構成としたもので、大きな塵埃は重力により集塵部の底部に溜まり、小さな塵埃は電動送風機側の集塵部上部に溜ることので、塵埃を分散させることができ、長期にわたって高い集塵性能を得ることができる。

【図面の簡単な説明】

【図1】本発明の第1の実施例を示す電気掃除機の側面断面図

【図2】図1のA-A断面図

【図3】本発明の第1の実施例を示す電気掃除機の遠心力集塵部を回動させた一部破断側面図

【図4】同電気掃除機のケース体に切り欠き部を設けた断面図

【図5】本発明の第2の実施例を示す電気掃除機の側面断面図

【図6】図5のB-B断面図

【図7】本発明の第2の実施例を示す電気掃除機の要部断面図

【図8】同電気掃除機の逆止弁の回動動作を示す要部断面図

【図9】同電気掃除機の羽根が配設された逆止弁の回動動作を示す断面図

【図10】本発明の第3の実施例を示す電気掃除機の断面図

【図11】本発明の第4の実施例を示す電気掃除機の要部断面図

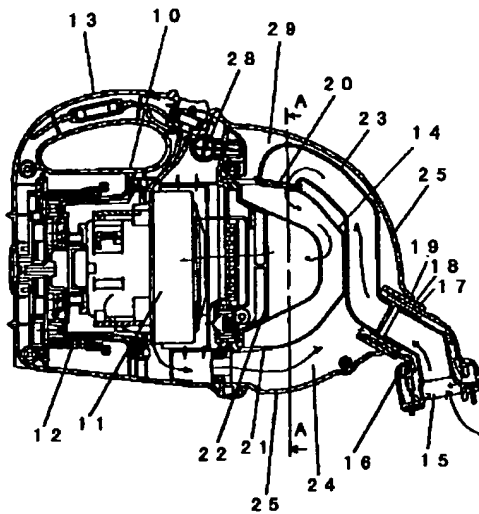
【図12】本発明の第5の実施例の電気掃除機の側面断面図

【図13】従来の電気掃除機の側断面図

【符号の説明】

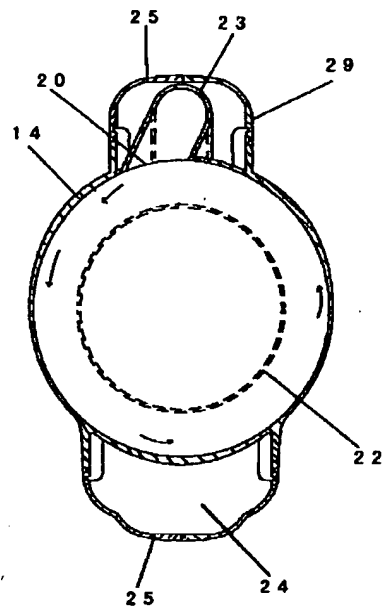
- | | |
|-----|-------------|
| 10 | 掃除機本体 |
| 11 | 電動送風機 |
| 14 | 遠心力集塵部 |
| 15 | 吸い込み口 |
| 16 | 吸口体 |
| 22 | フィルター |
| 23 | 吸込み管（吸込通路部） |
| 24 | 排気通路部 |
| 25 | ケース体 |
| 29 | 把手 |
| 30 | 切り欠き部 |
| 31 | 逆止弁 |
| 31a | 回動中心 |
| 33 | 羽根 |
| 35 | 吸気口接続部 |
| 35a | 空気入り口 |
| 36 | 湾曲形状 |
| 37 | 突出部 |
| 38 | 平坦部 |
| 39 | 凹部 |
| 40 | 塵埃捕集室 |
| 41 | 凸状のリップ |
| 42 | 吸気パイプ |

【図1】

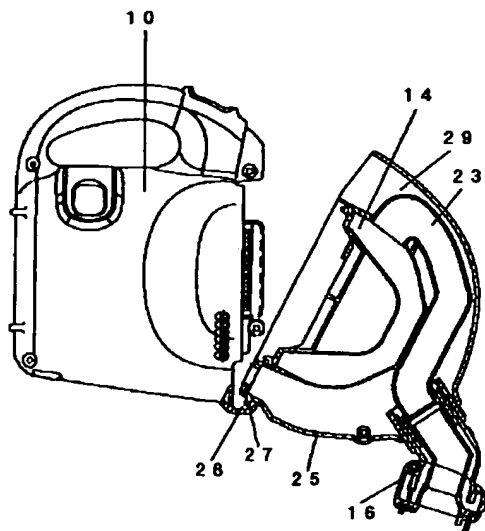


- | | |
|-----------|----------|
| 10 掃除機本体 | 22 フィルター |
| 11 電動送風機 | 23 吸込み管 |
| 14 遠心力集塵部 | 24 排気通路部 |
| 15 吸い込み口 | 25 ケース体 |
| 16 吸口体 | 29 把手 |

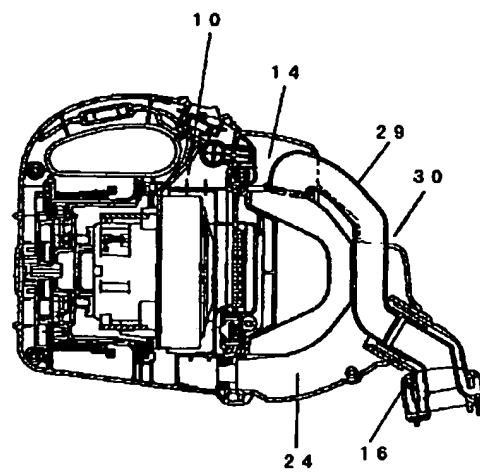
【図2】



【図3】

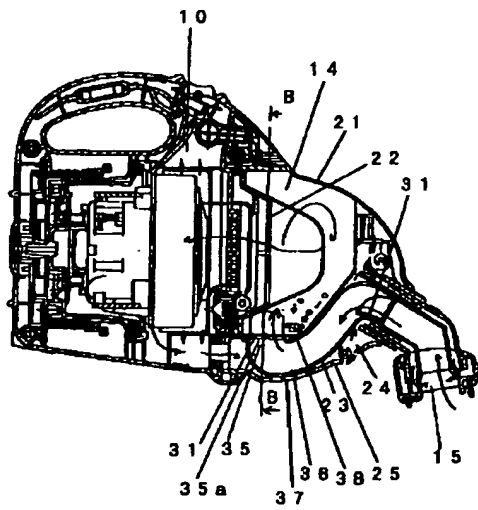


【図4】



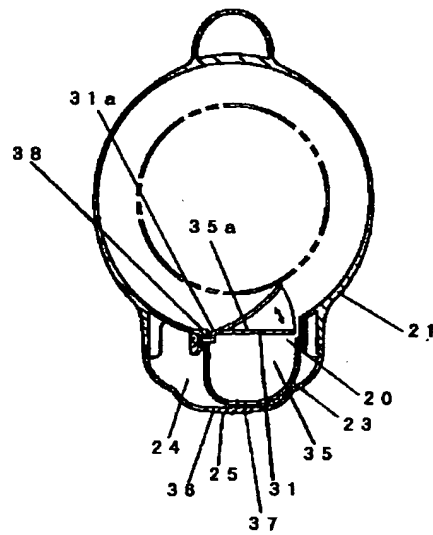
30 切り欠き部

【図5】



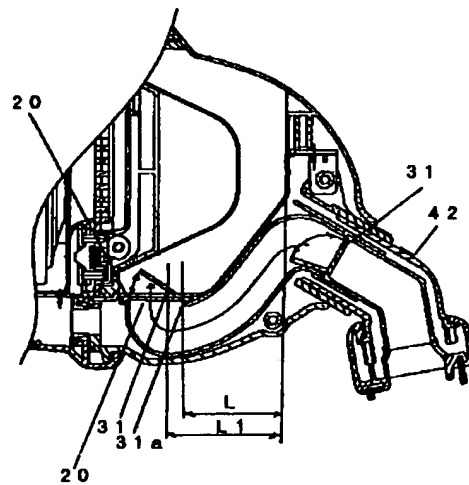
- 31 逆止弁
 35 吸気口接続部
 35a 空気入り口
 36 湾曲形状
 37 突出部
 38 平坦部

【図6】



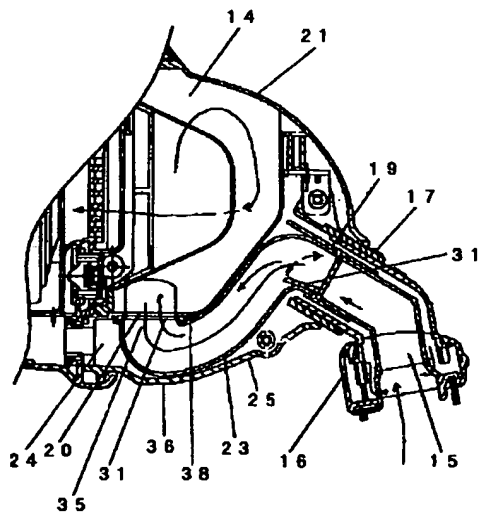
31a 回転中心

【図8】

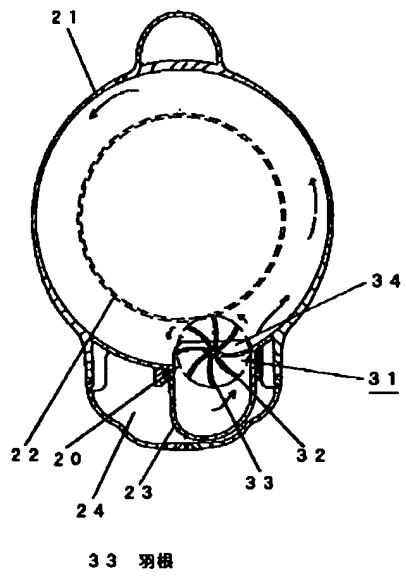


31a 回転中心

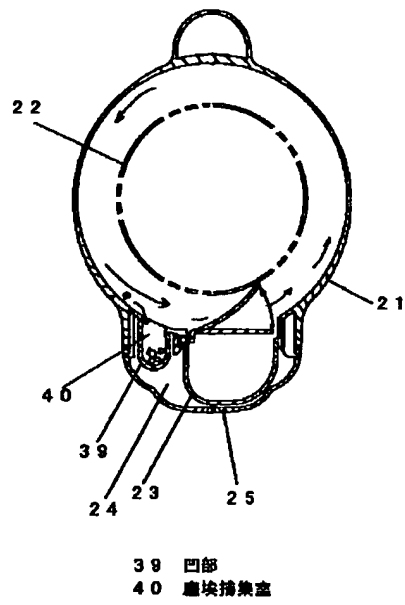
【図7】



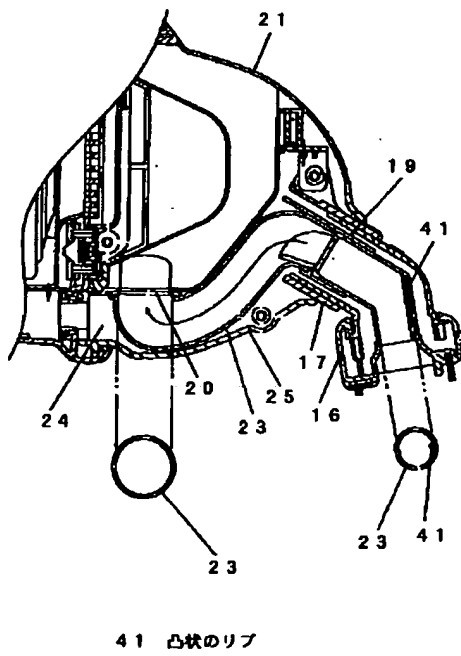
【図9】



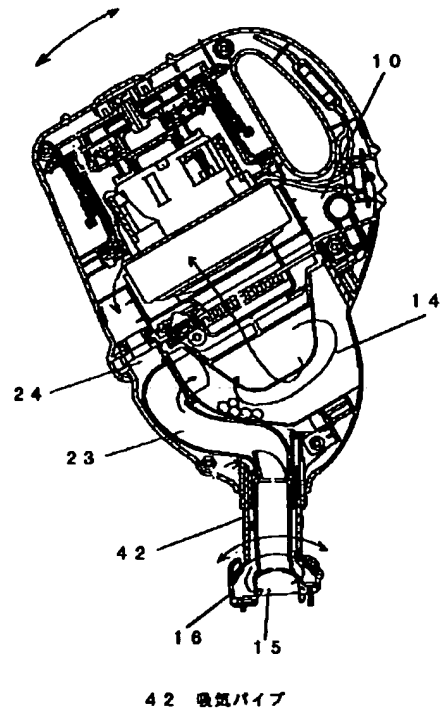
【図10】



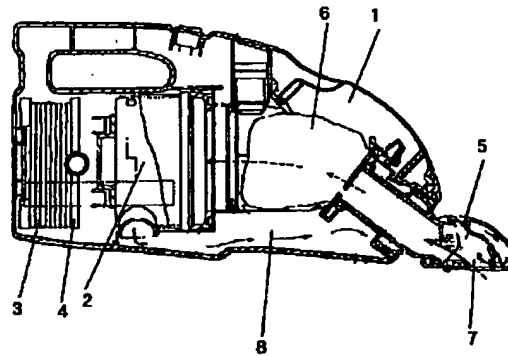
【図11】



【図12】



【図13】



フロントページの続き

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